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A study to assess the effectiveness of structured teaching programme on knowledge regarding food adulteration and its health implication among women at selected community area, Kollam

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Abstract

Introduction: Food adulteration is the process of reducing a product's quality or nature by removing essential components and adding a foreign or inferior material. Food adulteration is a big health concern these days. The purpose of the current study was to evaluate the effectiveness of a structured education program on food adulteration and its health implications among women at selected community area, Kollam.

Materials and methods: The study was conducted among 60 women by using quasi experimental pre-test post-test design at selected areas of Pallithottam, Kollam. The study adopted a convenient nonprobability sampling technique. demographic proforma and a structured knowledge questionnaire were used to acquire data. Descriptive and inferential statistics were used to tabulate and evaluate the data.

Result: In the pre-test in control group majority belongs to average level of knowledge (73.33%) and remaining 26.67% belongs to poor knowledge where in the experimental group majority were having average level of knowledge (76.67%) and remaining (16.67%)were having poor level of knowledge and 6.66% good level of knowledge. After the structured teaching programme the result shows that in knowledge calculated "t" value (28.363) is higher than that table value 2.045 at 0.05 level of significance. The result also showed that there was significant association between knowledge and demographic variables like age, and previous source of knowledge.

Conclusion: The structured teaching program was effective in increasing the knowledge regarding food adulteration and its health implication among women.

Keywords: Assess, effectiveness, structured teaching program, knowledge, food adulteration, health implications, women

Introduction

"Let your food be your medicine and your medicine be your food"

-Hippocrates

An organism uses food, which is mostly composed of protein, carbohydrates, and fats, to promote growth, repair, and other vital processes in addition to providing energy. But the meals we eat must also be safe and provide all the nutrients our bodies need. Food adulteration is the process of lowering a product's quality by adding inferior ingredients or eliminating essential components [1]."

Particularly in developing countries, food adulteration is a serious public health concern. Numerous health issues, including food-related infections, organ damage, and long-term chronic diseases, may arise from this issue [2]. According to the Knowledge Center for Food Fraud and Quality, 419 incidents were recorded worldwide in 66 countries in 2023. Europe, South America, Africa, North-Central America, and Australia accounted for the majority of cases. Alcohol-beverage adulteration was the most common (18.13% of all cases recorded worldwide in 2023), followed by beef and meat products (15.03%), fish and

shellfish (13.60%), and grain-based foods, cereals, and baked goods (11.69%). Grey market trading, mislabeling, document forgery, dilution/mixing, substitution, and unapproved augmentation were the most common types of fraud, according to an analysis of notification data. [3], According to estimates from the World Health Organization (WHO), 22% of food is adulterated worldwide, affecting a startling 57% of the population. According to an FSSAI report, 28% of food is tainted.

Many people don't have a good education, and their financial circumstances are inadequate. They are still ignorant of the harmful effects of food adulteration on people. They used to eat such tainted food, which was unhealthy for them [4]. Human health issues caused by food adulteration include a higher chance of cancer, pathological lesions in vital organs, anomalies of the skin and eyes, anemia, abortion, paralysis, and stomach and body aches. Food adulteration must be addressed since it has a substantial influence on public health [5].

The researcher visited homes in Pallithottam, Kollam, as part of their community health nursing posting. The researcher discovered throughout the survey that people in

the Pallithottam neighbourhoods consume a lot of packaged goods, like pizzas, bottled drinks, candies, etc., and that they prefer junk food to homemade cuisine. The researcher thought that there was a lack of awareness about food adulteration and its health effects while speaking with the subject. Thus, the researcher chose to carry out research on organized education programs about food adulteration and its effects on women's health.

Aims
Primary aims
To determine the efficacy of a systematic education program on food adulteration and its health implications for women in a particular community area in Kollam.

Secondary aims
- To assess the existing level of knowledge regarding food adulteration and its health implication among women.
- To identify the health implication regarding food adulteration.
- To understand the association of knowledge with selected demographic variables.
- To assess the existing level of knowledge regarding food adulteration and its health implication among women.

Objectives
1. To assess the knowledge regarding food adulteration and its health implication among women at selected community area, Kollam.
2. To evaluate the effectiveness of structured teaching programme on knowledge regarding food adulteration and its health implication among women at selected community area, Kollam
3. To find the association between knowledge regarding food adulteration and its health implication with demographic variable among Women at selected community area, Kollam.

Hypothesis
H_1: There will be significant difference between the pre-test and post-test knowledge score regarding food adulteration and its health implications among women in experimental group after administering structured teaching program.

H_2: There will be significant difference between the mean post-test knowledge score regarding food adulteration and its health implication among women after administering structured teaching program at selected community area, Kollam.

H_3: There will be significant association between mean pre-test knowledge score regarding food adulteration and its health implication among women and selected demographic variables.

Materials and Methods
The methodical approach to conducting research to address an issue is known as research methodology.
- **Research Approach:** Quantitative research approach
- **Research Design:** Quasi-experimental pre-test- post-test control group design

Variables
- **Dependent variable:** Knowledge regarding food adulteration and its health implications among women at selected community area, Kollam.
- **Independent variable:** Structured teaching programme on knowledge regarding food adulteration its and health implication among women.
- **Demographic variables:** Demographic variables include age in years, education, income per month, type of family, and previous source of knowledge.
- **Research setting:** In the selected community area Pallithottam at Kollam (Nagars, namely Donbosco Nagar and Centuri Nagar)
- **Population:** women between the age group of 21-60 residing at Don Bosco Nagar and Century Nagar
- **Sample size:** sample consist of 60 women in Pallithottam at Donbosco Nagar and Centuri Nagar, 30 participants in experimental group and 30 participants in control group
- **Sampling techniques:** Non probability convenient sampling technique was used.

Inclusion criteria
- The Pallithotam women.
- Women who agree to take part in the research.
- Women who are literate in Malayalam.
- Women who are accessible when the data is being collected.

Exclusion criteria
- Women who have job related to medical/health department.
- Women who are critically ill.
- Women having inconvenience due to physical problem.

Tool / Instruments
- **Section A: Demographic Performa**
- After extensive review of literature and receiving suggestions and opinions from experts the first section was prepared which includes demographic data of household women such as age in years, education, income per month, type of family, previous source of information.
- **Section B: Self-structured knowledge questionnaire** to assess knowledge regarding food adulteration and its health implications among women. It consists of 25 multiple choice questions; each question carries one mark for right answer and zero mark for wrong answer.

Technique
Interventional programme
Structured teaching programme will be used as intervention. In structured teaching program that mainly include definition, types, causes, methods, health implications, detection in households and prevention of food adulteration. Duration of this program was 30 minutes. Researcher given structured teaching program in two sections, one conducted at morning and one conducted at evening. In each section included 15 members.

Pilot study: The pilot study was carried out between December 6–14, 2024, in Anugraha Nagar and Snehatheeram at Pallithottam, Kollam. Official consent was acquired from relevant authorities, including the medical officer of the Pallithottam community health Centre and the institutional ethnic committee. Six samples of women were chosen using a non-probability convenience sampling strategy based on inclusion and exclusion criteria (three samples from the experimental group from Snehatheeram and three samples from the control group from Anugraha Nagar). The pre-test was conducted after obtaining informed consent from the chosen samples. Following a pre-test structured instruction session for the experimental group, the post-test results were completed on the seventh day following the questionnaire administration for both groups. The demographic variables were analyzed using frequency and percentage, and the pre- and unpaired "t" tests were employed to compare the test and post-test knowledge ratings. To determine the relationship between pre-test knowledge and particular demographic characteristics, the chi square test was employed. It was determined that the investigation was viable and useful. As a result, the researcher moved forward with the primary investigation. Data collection process.

The research study synopsis, tool, informed consent using for the study is presented before the medical officer of community health centre, Pallithottam along with the permission seeking letter. Permission was granted by the medical officer for conducting the study. The data collection was done in the Donbosco Nagar and centuri Nagar of Pallithottam community area from 19/12/2024- 27/12/2024. A total of 60 samples were taken. Experimental group was taken from Donbosco Nagar and control group was taken from centuri Nagar by non- probability convenient sampling method based on inclusion criteria and exclusion criteria. Informed consent is taken from the samples on 19/12/2024 and pre-test was done in control group on 19/12/2024. Pre-test done in experimental group on 20/12/2024. After pre-test structured teaching program of 30 minutes was given for the experimental group. Intervention provided in two

sections. One section conducted at 20/12/2024 morning and one was conducted at evening. Each section included 15 participants. Post-test was done in control group on 26/12/2024 and post-test done in experimental group on 27/12/2024

Ethical consideration
The concerned community health center granted authorization to the researcher. The study's proposal was submitted to the institutional ethics committee for approval. The researcher was scheduled to carry out research in the chosen field following committee permission. The subjects' informed consent was obtained. The researcher promised the responders that their information would be kept private and anonymous.

Analysis and interpretation
The data analysis was done by using Descriptive and inferential statistics method based in the hypothesis of the research study. For presenting the analyzed data figures, graphs, and tables was used. The descriptive statistical analysis was done using frequency and percentage distribution. Paired "t" test was used to determine the statistically significant difference between pre-test and post-test scores in experimental group. Unpaired "t" test was used to determine the significant difference between post-test scores of experimental and control group. Chi-square test was used to find the significant association between the pre-test knowledge scores among women and selected demographic variables such as age, education, type of family, income per month, previous source of information regarding food adulteration and its health implications.

Results
Section A: Sample characteristics
The frequency and percentage distribution of the sample characteristics of sixty women in the Pallithottam community area (Centuri Nagar, Donbosco Nagar) according to age, monthly income, and education are covered in this section. Family type and prior knowledge source

Table 1: Frequency and percentage distribution of demographic variables according to baseline characteristics.

Sl. No	Demographic variables	Experimental group (30)		Control group (30)	
		Frequency	Percentage	Frequency	Percentage
1	Age in year				
a)	21-30 year	6	20%	7	23.33%
b)	31-40 year	6	20%	4	13.34%
c)	41-50 year	9	30%	12	40%
d)	51-60 year	9	30%	7	23.33%
2	Income per month				
a)	≥135169	0	0	0	0
b)	67587-135168	0	0	0	0
c)	50560-67586	0	0	0	0
d)	33793-50559	2	6.67%	0	0
e)	20274-33792	0	0	2	6.67%
f)	6768-20275	9	30%	6	20%
g)	≤6767	19	63.33%	22	73.33%
3	Education				
a)	Illiterate	0	0	0	0
b)	Primary education	15	50%	12	40%
c)	SSLC and HSE	13	43.33%	16	53.34%
d)	Graduate	2	6.67%	1	3.33%

e)	Post graduate	0	0	1	3.33%
4	**Type of family**				
a)	Nuclear family	22	73.33%	20	66.67%
b)	Joint family	8	26.67%	10	33.33%
c)	Extended family	0	0	0	0
d)	Single parent family	0	0	0	0
5	**Previous source of knowledge**				
a)	Book and magazines	0	0	0	0
b)	Social media	17	56.67%	18	60%
c)	Health workers	5	16.67%	6	20%
d)	No knowledge	8	26.66%	6	20%

In the control group majority of sample belongs to the age group of 41-50 years (40%) and in the experimental group majority of sample belongs to the age group of 41-50 years and 51-60 years (30%). In control group 73.33% have monthly income ≤6767 Rs and in experimental group 63.33% have monthly income of ≤6767 Rs. In control group majority of sample belongs to SSLC and higher Secondary education (53.34%) and in experimental group majority of sample belongs to primary education (50%). Distribution of samples according to the type of family showed that in control group 73.33% samples belongs to nuclear family and 26.67% belongs to joint family. In experimental group 66.67% belongs to nuclear family and 8% belongs to joint family. In the control group majority of samples gained knowledge from the social media (60%) and in the experimental group majority of sample gained knowledge from social media (56.67%).

Section B: Description of level of knowledge of women regarding food adulteration and its health implication.

Table 2: Description of level of knowledge of women regarding food adulteration and its health implication in pre-test of experimental group (30) and control group (30). N=60

Level of knowledge	Control group (30)		Experimental group (30)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Poor (<7)	8	26.67%	5	16.67%
Average (7-12)	22	73.33%	23	76.67%
Good (13-18)	0	0	2	6.66%
Excellent (19-25)	0	0	0	0

Data in table 2 shows that in pre-test of control group majority belongs to average level of knowledge (73.33%) and remaining 26.67% belongs to poor knowledge. In pre-test of experimental group, majority were having average level of knowledge (76.67%) and remaining (16.67%) were having poor level of knowledge and 6.66% good level of knowledge.

Table 3: Description of level of knowledge of women regarding food adulteration and its health implication in post-test of experimental group (30) and control group (30). N=60

Level of knowledge	Control group (30)		Experimental group (30)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Poor (<7)	6	20%	0	0
Average (7-12)	24	80%	0	0
Good (13-18)	0	0	19	63.33%
Excellent (19-25)	0	0	11	36.67%

Data in table 3 shows that in post-test of control group majority belongs to average level of knowledge (80%) and remaining 20% belongs to poor knowledge. In post-test of experimental group majority were having good level of knowledge (63.33%) and remaining (36.67%) were having excellent level of knowledge

Section C: Evaluation of effectiveness of structured teaching program on knowledge regarding food adulteration and its health implications among women.
In order to find the effect of structured teaching program on knowledge regarding food adulteration and its health implication among women by comparing the pre-test and post-test knowledge score of women in experimental group, paired "t" test were used.

H₁: There will be significant difference between the pre-test and post -test knowledge score regarding food adulteration and its health implication among women in experimental group after administering structured teaching program.

Table 4: Mean standard deviation and "t" value of pre-test and post- test knowledge score of the experimental group (30) after structured teaching program N=60

Experimental group	Mean	Standard deviation	"t" value
Pre-test	9.23	2.36	28.3630*
Post-test	17.80	1.94	

Tabulated t(t29) =2.045 *Significant

The calculated paired "t" value is greater than table value at 0.05 level of significance. Hence research hypothesis H_1 was accepted. So, there is a significant difference in pre-test and post-test knowledge score after administering structured teaching program.

Comparing post-test knowledge scores of experimental group (30) and control group (30).
For comparing the post-test knowledge scores of experimental group and control group unpaired "t" test is used.

H₂: There will be significant difference between the mean post-test knowledge score regarding food adulteration and its health implication among women after administering structured teaching program at selected community area. Kollam.

Table 5: Mean standard deviation and "t" value of post-test knowledge score of the experimental group (30) and control group (30) N=60

Post-test	mean	Standard deviation	"t" value
Experimental group	17.80	8.80	17.5193*
Control group	1.94	2.04	

Tabulated t (58) =2.00 *Significant

The calculated unpaired paired "t" value is greater than table value at 0.05 level of significance. Hence research hypothesis H$_2$ was accepted. So, there is a significant difference in post-test knowledge score of the experimental group and control group after administering structured teaching program.

Section D: Association between mean pre-test knowledge regarding food adulteration and its implication with selected demographic variables.
In order to find association between knowledge regarding food adulteration and its implication with selected demographic variables Chi-square test were used.

H$_3$: There will be significant association between mean pre-test knowledge regarding food adulteration and its health implication among women and selected demographic variables

Table 6: Association between pre-test knowledge score and selected demographic variable. N=60

SI. No	Demographic Variables	Knowledge Score		χ_2	df	Table value	Level of significance
		Poor	Average / Good				
1.	Age						
a)	21-40 years	1	22	11.7345	2	5.9991	S
b)	41-50 years	2	19				
c)	51-60 years	7	9				
2.	Income per month						
a)	6768-50559 rs	2	17	0.7548	1	3.841	NS
b)	≤6767 rs	8	33				
3.	Education						
a)	Primary	5	22	0.1212	1	3.841	NS
b)	SSLC and HSE	5	28				
4	Type of family						
a)	Nuclear family	10	32	0.3788	1	3.841	NS
b)	Joint family	3	15				
5	Previous source of knowledge						
a)	Social media	2	33	26.6988	2	5.9991	S
b)	Health worker	1	10				
c)	No knowledge	10	4				

*Significant at 0.05 level S-significant NS- Not significant

The data in table 6 shows that there is significant association between pre-test knowledge score with age and previous source of knowledge. Since the calculated chi square value is greater than 0.05 level of significance. Hence the research hypothesis H$_3$ is accepted.
Since the chi-square value for monthly income, type of family and education are less than the table value at 0.05 level of significance. So, research hypotheses H$_3$ is rejected

Discussion
The study assessed the knowledge regarding food adulteration and its health implication among women at selected community area, Kollam. The findings of the present study showed that in pre- test of control group, majority belongs to average level of knowledge (73.33%) and remaining 26.67% belongs to poor level of knowledge. In pre- test of experimental group majority were having average level of knowledge (76.67%) and remaining (16.67%) were having poor level of knowledge and 6.66% good level of knowledge. The findings of the present study were supported by similar descriptive research study was conducted to assess the knowledge regarding food Adulteration among housewives. The percentage distribution of housewives based on their overall knowledge level indicates that the largest percentage (38%) of housewives possessed average knowledge. The smallest percentage (6%) of housewives had extremely limited knowledge, while 28% possessed good knowledge [6].

This structured teaching program was effective in increasing the knowledge regarding food adulteration and its health implications among women. The present study findings show that in the experimental group the mean post-test score (17.80±1.94) were higher than that of the mean pre-test knowledge score (9.23±2.36). The calculated "t" value 28.363 is higher than that of the table value 2.045 at 0.05 level of significance. In the control group the mean post-test score (1.94±2.04) was lower than that of the mean post-test knowledge score of the experimental group (17.80±1.94). The calculated "t" value 17.519 is higher than that of the table value 2.00 at 0.05 level of significance. The findings of the present study were supported by a quasi-experimental research design to assess the effectiveness of video assisted teaching on food adulteration and its ill effects among homemakers. The mean score for knowledge on the pre-test was 8.18±2.08, while the post-test mean score for knowledge was 17.58±1.69. The computed paired "t" test value of t = 33.164 was determined to be statistically very significant at the *p*<0.001 level. This clearly indicates that the implementation of Video Assisted Teaching regarding knowledge on food adulteration and its adverse effects in homemakers was effective in enhancing their knowledge level in the post-test [7].
Association analysis showed that there was significant association between knowledge regarding food adulteration

and its health implications among women with the demographic variables like age and previous source of knowledge at 0.05 level of significance. This finding was supported by a community based descriptive study was carried out to assessment of knowledge and perception regarding food adulteration among homemakers in selected areas of Kamrup District. A notable association was discovered between Knowledge and age, religion, family structure, monthly income, and information sources. Likewise, a notable connection was identified between perception and age, religion, monthly income, and sources of information [8]. Overall, the findings indicate that structured teaching programmes are effective tools for improving knowledge regarding food adulteration and its health implications among women.

Conclusion
The structured teaching programme was effective in improving knowledge regarding food adulteration and its health implication among women. There was a significant increase in post-test knowledge scores in the experimental group compared to the control group, indicating the positive impact of the intervention. Overall, the study highlights the need for continuous community-based educational programmes to promote awareness and ensure safer food practices.

Author's Contribution
Not available

Conflict of Interest
Not available

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