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Effectiveness of Information, Education and Communication (IEC) Package on Knowledge Regarding Health Hazards of Junk Food among the Mothers of School Children in Selected Urban Area, Mangalore

Maharjan Purna Devi

Lecturer, National Academy of Medical Sciences, Bir Hospital Nursing Campus, Gausala, Kathmandu, Nepal

Abstract: ***Background: 'Eat healthy and live healthy' is one of the essential requirements for long life. Changes in our society have intensified the need for food skills, to the extent that mothers need to become a part of the child's basic education as well as her knowledge for good health and survival. Majority of working mothers of school children are laboured with exhausting commutes, upswings in the households, and stress, leading to a situation where they get to spend limited time in gaining knowledge on junk food. Junk foods are rich in fats and poor in other nutrients. Because of advertisement of junk foods and business as well as busyness society, today's world has been adapted to a system of consumption of junk foods which has several adverse effects on health. Globalisation and urbanisation have greatly affected one's eating items and habits and forced many people to consume fancy and high calorie fast foods. Method: A pre-experimental, one group pre-test pos-test design with an evaluative approach was used in Gujerekere, under Jeppu PHC, Mangalore, on 60 mothers of school children who met the inclusion criteria. Purposive sampling technique was used. Data was collected by administering a structured knowledge questionnaire before and after the administration of IEC package. On the first day, pre test was conducted and after which IEC package was administered. The post test was conducted on the eight day after the administration of IEC package using same structured knowledge questionnaire. Result: Majority of the samples 47(78.3%) had average knowledge and remaining 13(21.7%) of them had good knowledge in pre-test and, in post test, majority of the samples 49 (81.7%) had good knowledge and 11(18.3%) had average knowledge and none of them had poor knowledge regarding health hazards of junk food in pre test and post test. The overall mean percentage level of knowledge is 75.89 with mean and standard deviation 22.767±2746 of post-test was higher than pre-test mean percentage level of knowledge is 60.56 with mean and standard deviation 18.167±3.655. The finding revealed that the calculated 't' value (t_{59}= 13.317) is greater than the table value (t_{59}=2.01) at 0.05 level of significance. It indicated that the administration of IEC package was effective. The finding of the study revealed that there is significant association between pre-test knowledge and mothers' occupation (χ^2=0.035, p<0.05) and types of family (χ^2=0.042, p<0.05), whereas no significant association between pre test knowledge and remaining demographic variables. There is significant association between post-test knowledge and family income (χ^2 = 0.025, p<0.05) and no significant association between post-test knowledge and remaining demographic variables. Interpretation and conclusion: The findings of the study support the need for providing IEC package to improve the knowledge of the mothers of school children regarding health hazards of junk food. The study proved that the mothers have average knowledge regarding health hazards of junk food. Their knowledge improved remarkably after administering IEC package. So the findings also prove that the IEC package was effective in terms of gain in knowledge.***

Keywords: Junk food; health hazards; knowledge; IEC package; mothers of school children

1. Background of the Study

Habits start young, and it is up to the environment like home and school primarily to cultivate healthy habits in children. Home is the first school and parents are the first teachers of their life; the school being the next-best home for learning and nurturing. During early childhood, the body grows at an alarming rate. This rate slows down after 1 year of age and may occur in spurts throughout childhood, adolescence, and puberty. A child needs healthy diet or adequate dietary intake to provide enough nutrients and energy for him to grow, without reducing his body's ability to stay healthy.[1]

A healthy diet, rich in micro- and macro nutrients, will enable mental and physical growth. Foods like, wheat flour, boiled rice, green leafy vegetables, grains, fruits, milk etc. are considered healthy diet.[2] Children's poor dietary pattern affects on their weight, health, and cognitive development.[2] Children depend on their families and teachers to support their well being and promote positive development, including eating food items and behaviours. Children's food preferences and willingness to try new foods are influenced by parents and the people around them.[3]

These practices early in life, affect their health and nutrition which are significant factors in childhood overweight and obesity.[4] Parents' knowledge and behaviour can influence children's dietary practices in many areas, availability and accessibility of foods; meal structure and food-related parenting styles. So every parent, especially mothers should know the health hazards of different harmful food,[5] because female has more responsibility of food preparing to their children in their home, in our developing country.

Harmful foods like junk foods and its operations are now important part of modern catering practice largely through the growth of international franchisee chains.[6] Junk foods include those food items that do not add any value to a person's diet like, essential nutrients, vitamins and minerals,

etc. Fast food, canned food, snacks and soft drinks are taken as junk food, i.e., Coca-cola, soda pop, pizza, noodles, deep fried food items, and other food items which are prepared at same repeated fried oil or fat[7]. These foods are easily available in any places like on street food shop, restaurants, commercial shop, etc. Vending machines, drive-through restaurants, and 24 hour convenience stores are probably the most common places to find fast food. Fast food is inexpensive because it is usually made with cheaper ingredients such as high saturated fat, salt, calorie, refined grains, and added high sugar and fats; instead of nutritious foods [8]. These ingredients are harmful for health, which may cause different types of diseases.

Consumption of diet with harmful ingredients content in children can lead to early development of obesity, hypertension, dyslipidemia and impaired glucose tolerance[9]. Fast foods have high level of fat and sugars, addictive and that creates a vicious cycle making it hard for children to choose healthy food. High content of trans fat and food addictives in commercially available junk foods predispose children to risk of future heart diseases[10]. Snacks and fast food intake leads to higher proportion of calories being derived from unsaturated fat [11]. The micronutrient content calcium, iron, vitamin A, vitamin C of the food is low in junk food[12]. Low levels of calcium and magnesium in the diet can contribute to osteoporosis. That is frangibility of bone and cause weakness of bone, leads risk of bone fracture or broken easily. Diets rich in dense sugars can lead to increased risk of dental caries and type 2 diabetic mellitus. Junk foods often contain colours that are inedible, carcinogenic and harmful to the body. Food colouring may result in hyperactivity and lapses of concentration in children.[13]

According to the WHO, in the year 2005, approximately 1.6 billion adult (age 15+) were overweight, at least 400 million adults were obese, and 20 million children under the age of 5 years are overweight. The WHO also projected that by 2015, approximately 2.3 billion adults will be overweight and more than 700 million will be obese. The WHO also shows the prevalence of those who are overweight or obese has increased between 2002 to 2010 for both males and females due to habit of fast food and unhealthy dietary pattern.[14] In India, junk food is locally called 'chaat.' It mostly includes the famous samosas, kachoris, panipuris/golgappas and patties. These are fried items with various fillings within an outer layer made of refined flour. In India, even Chinese food sold in road-side stalls is junk food because they contain high amount of Monosodium Glutamate (MSG), which is a flavour enhancer. MSG is recognized as a health hazard if taken in larger quantities.[15] National Survey of India published in its report that 30% of adolescents have dental carries, 17% are overweight the problem is growing literally. Overweight teenagers are now a very visible urban phenomenon. In Delhi and Chandigarh, one in every four teenagers are obese while the study of school children in Chennai shows 18% boys and 16% girls are overweight because of eating habits of junk food items.[16] These problems are increasing day by day. So everybody as well as mother must be aware about junk food and its health hazards to prevent further problems.

Mothers of school children need to apply food knowledge and decide for themselves what is right and what are not about food and its patterns as well as ingredients. Knowledge about the junk food and its health hazards leads to reduce obesity, dental carries, increase in cholesterol, high blood pressure and cardiac problems. So everybody must keep certain amount of awareness about food nutrition so that healthy food can be provided but not a junk food. A research article has revealed that fast foods such as noodles do not get digested for 2 to 4 hours till they are forced to break down by stomach digestive system. This gives lots of trouble to the stomach. Furthermore, industrial processing depends upon products that have a negative impact on our health.[17] According to NSS (National Sample Survey) data for the category beverages, refreshments and processed foods, the money spent on junk food in India was almost 25 per cent higher than the Rs 33,000 crore spent on edible oils. According to NFHS (National Federation of State High School Associations), Punjab ranks first in the list of overweight people.[18] Research has shown that junk food consumption is linked to behavioural disorders. Many people, especially children, suffer from ADHD (attention deficit hyperactive disorder) due to additives and added sugar in junk food. Drinking a single 330 ml can a day of sugary drinks translates to more than one pound (0.45 kg) of weight gain every month. Government surveys have shown that at least 16% children and adolescents aged 6 to 19 years are considered overweight and at least 11% adolescents now are classified as obese.[18] Nutrition counselling regarding the importance of balanced diet, harmful effects of junk foods will help to curb the junk food addiction and improving their nutritional status. There is need to focus on nutrition counselling to facilitate the intake of healthy foods like fermented foods, wheat noodles by adding lots of vegetables, sprouted pulses, sprouted tikki, vegetable samosa and cutlets, and wheat and multigrain bread.[19] School children are the pillars of the county. They should be healthy. So need to feed them healthy diet. There are lot of diseases emerging globally due to diet and other causes. To prevent these diseases, the children and their care giver should be made alert that prevention is better than cure. Basically the school children are depended on their parents. Parents, especially mothers, have more responsibility to prepare food and food habits of their children in developing country. For reducing the burden of potential disease from junk food all mothers should be aware of junk food and its hazards. From above information, studies and reasons, the researcher felt the need to assess the knowledge regarding health hazards of junk food among the mothers of school children and provide IEC package to prevent from its effects like obesity, hypertension, dental carries, etc.

Objectives of the study

1) To assess the level of knowledge regarding health hazards of junk food among mothers of school children.
2) To evaluate the effectiveness of information, education and communication (IEC) package on knowledge regarding health hazards of junk food among mothers of school children.
3) To find the association between level of knowledge regarding health hazards of junk food among mothers of school children and selected demographic variables.

Hypotheses

The hypotheses will be tested at 0.05 level of significance.

H_1: There will be significant difference between pre-test and post-test knowledge score regarding health hazards of junk food among mothers of school children.

H_2: There will be significant association between pre-test level of knowledge on health hazards of junk food among mothers of school children and their selected demographic variables.

H_3: There will be significant association between post-test level of knowledge on health hazards of junk food among mothers of school children and their selected demographic variables.

2. Literature Review

1) Literature related to knowledge of mother on junk food

A study was conducted to determine the effects of mother's nutritional knowledge on attitudes and behaviours of children about nutrition in Ankara, Turkey. The inventory was given to the 302 mothers to determine their nutritional knowledge and attitudes and behaviours about their children's nutrition. The study revealed that the mothers who have higher level nutritional knowledge feed their children more nutritional and fibre rich diet (vegetable 64.7% (0.005; p<0.01), fruit 75.3% (0.00; p<0.001)), and less sugared drinks such as pops, juice and fast foods 85.9% (0.075) than the mothers who have lower level of nutritional knowledge (48.5%, 53%, 78% respectively). It is found that high nutritional knowledge level mothers give less butter spread breads, and high fat included foods such as sausage, hot dog and salami 66.7% (0.001; p<0.001) v/s 82.9% (0.001; p<0.001). The study concluded that restrictive behaviour of the mothers thought about having that kind of fat included foods could be making their energy level low[19].

2) Literature related to risk of junk food/ hazards of junk food

The large prospective Cohort study was conducted between 1996 and 2003 to examine relation of intake of artificially-sweetened beverages during pregnancy with child asthma and allergic rhinitis at 18 months and 7 years. The analysed data from 60,466 women enrolled during pregnancy. At 25th week of gestation and administered a validated Food Frequency Questionnaire about intake of artificially-sweetened soft drinks. At 18 months, the researcher evaluated child asthma using interview data and assessed asthma and allergic rhinitis through a questionnaire at age 7 and by using national registries. Current asthma was defined as self-reported asthma diagnosis and wheeze in the past 12 months. Examined the relation between intake of artificially-sweetened soft drinks and child allergic disease outcomes and present odds ratios with 95% CI comparing daily vs. no intake. The study result revealed that at 18 months, mothers who consumed more artificially-sweetened non-carbonated soft drinks were 1.23 (95% CI: 1.13, 1.33) times more likely to report a child asthma diagnosis compared to non-consumers. Similar results were found for child wheeze. Consumers of artificially-sweetened carbonated drinks were more likely to have a child asthma diagnosis in the patient (1.30, 95% CI: 1.01, 1.66) and medication (1.13, 95% CI: 0.98, 1.29) registry, as well as self-reported allergic rhinitis (1.31, 95% CI: 0.98, 1.74) during the first 7 years of follow-up. It was found no associations for sugar-sweetened soft drinks. The study concluded that early childhood outcomes were related to non-carbonated soft drinks. These results suggest that consumption of artificially-sweetened soft drinks during pregnancy may play a role in offspring allergic disease development[20].

3. Methodology

Pre experimental "one group pre-test, post-test design", was adopted to assess effectiveness of Information, Education and Communication (IEC) package on knowledge regarding health hazards of junk food among the mothers of school children in selected urban area, Mangalore.

4. Major Findings of the Study and Discussion

Section I: Description of the demographic proform of mothers of school children

This section deals with the analysis of the demographic proforma of 60 mothers of school children.

The data regarding the demographic proforma is presented in following table.

Table: Frequency and percentage distribution of samples according to demographic variables, n=60

S. No.	Demographic variables	Frequency (f)	Percentage (%)
1	Age in years		
	25-30	19	31.7
	30-35	12	20
	35-40	14	23.3
	>=40	15	25
2	Educational status of mothers		
	No formal education	0	0
	Primary	11	18.3
	Secondary	17	28.3
	Pre university	17	28.3
	Graduate & above	15	25
3	Educational status of samples' husband		
	No formal education	2	3.3
	Primary	14	23.3
	Secondary	22	36.7
	Pre university	13	21.7
	Graduate & above	9	15
4	Religion		
	Hindu	48	80
	Christian	2	3.3
	Muslim	10	16.7
5	Occupation of the samples		
	Business	2	3.3
	Salary basis	15	25
	Daily wages basis	5	8.3
	Home maker	38	63.3
6	Family income per months		
	<=2000	9	15
	2001-5000	11	18.3
	5001-8000	11	18.3
	8001-10000	18	30
	>=10000	11	18.3
7	Types of family		
	Nuclear	14	23.3
	Joint	31	51.7
	Extended	8	13.3
	Single parent	7	11.7

8	Number of children		
	One	21	35
	Two	35	58.3
	Three	2	3.3
	More than three	2	3.3
9	Types of food habit		
	Vegetarian	14	23.3
	Non vegetarian	46	76.7
10	Do you provide junk food for your children in your home?		
	Yes	10	16.7
	No	50	83.3
A.	If yes, how often do you provide?		
	Daily	3	5
	1-2 times a week	6	10
	More than 3 times a week	1	1.7
	Never	50	83.3
B.	Why do you prefer junk food for children?		
	Easy to provide	5	50
	Time saving	5	50
11	Do you provide school lunch for your children?		
	Yes	60	100
	A. Type of lunch		
	1. Home made	53	88.3
	2. Readymade	7	11.7
12	Information previously regarding hazards of junk food		
	Yes	60	100
A.	Source of information		
	Mass media	31	51.7
	Health professional	18	30
	Neighbourhood	3	5
	Family and friends	8	13.3

Majority of the samples, 19 (31.7 %) were in the age group of 25-30 years. In educational status, majority of samples 17 (28.3%) each had secondary and pre-university education. In the educational status of samples' husbands, majority of them had secondary level education, that is, 22 (36.7%). Regarding religion, majority of samples 48 (80%) were Hindu. Majority of the samples 38 (63.3%) were home makers. Majority 18 (30%) of samples' family income was in between Rs. 8,001–10,000. Majority of the samples 31 (51.7%) belonged to joint family. Majority of the samples 35 (58.3%) had two children. Majority of samples 46 (76.7%) were non-vegetarian. Majority of samples 50 (83.3%) didn't provide junk food and only 10 (16.7%) had provided junk food to their children. Among the 10 (16.7%) samples, majority 6 (10%) had provided junk food 1-2 times a week, 3 (5%) had daily and only one (1.7%) samples had provided more than 3 times a week. Regarding reason of preferring junk food 50% answered that it was easy to provide and 50% answered that it was time saving. All of the samples (100%) had provided school lunch for their children. Majority of them 53 (88.3%) had provided homemade lunch. Majority of the samples, 31 (51.7%) got information from mass media.

Section II: Level of knowledge of the mothers of school children

This section deals with the analysis and interpretation of data to find out the pre-test and post-test level of knowledge among mothers of school children. Data was analysed using descriptive statistics and represented in table.

Table: Distribution of samples according to the pre-test & post-test level of knowledge, n=60

Level of knowledge	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Poor	0	0	0	0
Average	47	78.3	11	18.3
Good	13	21.7	49	81.7

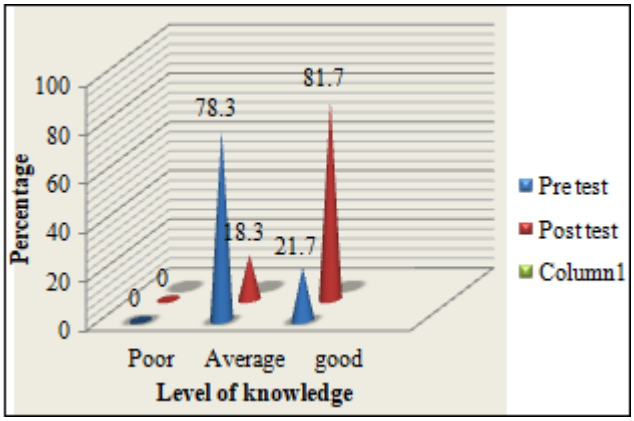

Figure: Pyramid diagram showing percentage distribution of pre-test & post-test level of knowledge among samples regarding health hazards of junk food

The data in table and figure shows that majority of the samples 47(78.3%) had average knowledge, 13(21.7%) of them had good knowledge and nobody had poor knowledge regarding health hazards of junk food during the pre-test. In the post-test, majority of the samples 49 (81.7%) had good knowledge and 11(18.3%) had average knowledge regarding health hazards of junk food.

In order to find out the significant difference between pre-test and post-test level of knowledge, a null hypothesis was formulated and paired 't' test was computed.

H_{01}: There is no significant difference between pre-test and post-test knowledge score at 0.05 level of significance.

Table: Overall all area-wise mean, mean percentage, SD value showing the difference between the mean pre-test levels of knowledge, n=60

S. No.	Areas of knowledge	Pre-test			
		Max. possible score	Mean	SD	Mean %
1	Meaning and types of healthy diet	5	3.5667	0.74485	71.33
2	Meaning and types of junk food	6	3.5167	0.98276	58.61
3	Harmful ingredient of junk food	5	3.1833	1.15702	63.67
4	Health hazards of junk food	14	7.8500	2.17712	56.07
	Overall knowledge score	30	18.167	3.655	60.56

The data in Table shows that in pre-test maximum knowledge was in the area of meaning & types of healthy diet, the mean percentage was 71.33, with a mean and standard deviation of 3.566±0.744 and lowest was in the area of health hazards of junk food, the mean percentage was 56.07 with a mean and standard deviation of 7.850± 2.177. In the area of harmful ingredient of junk food, the mean percentage was 63.67, with a mean and standard deviation of 3.183±1.157. In the area of meaning & types of

junk food, mean percentage was 58.61, with a mean and standard deviation of 3.516±0.982. The overall pre-test mean percentage was 60.56, with mean and standard deviation 18.167±3.655.

Section III: Effectiveness of IEC package on level of knowledge regarding health hazards of junk food

This section deals with analysis and interpretation of data collected from 60 samples in selected urban area to evaluate the effectiveness the IEC package on level of knowledge regarding health hazards of junk food. The pre-test and post-test level of knowledge of samples were analysed, conferred and depicted in table .

Table : Overall Mean, SD, Mean percentage and 't' value showing the difference between mean pre-test and post-test level of knowledge, n=60

Period of observation	Mean	Standard deviation	Mean percentage	't' value	P value
Pre-test	18.17	3.66	60.56	13.31*	0.000
Post-test	22.77	2.74	75.89		

$t_{59=}$2.01, p<0.05 * significant

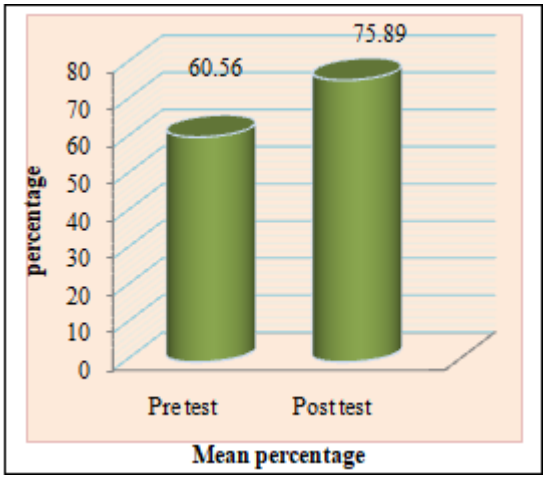

Figure: Cylinder diagram comparing the mean percentage of pre-test and post-test level of knowledge

Data in Table & Figure shows that overall mean percentage of pre- test is 60.56 with mean and Standard deviation (SD) 18.167± 3.655, which is lower than the mean percentage of post-test mean percentage 75.89 with mean and SD 22.767 ± 2.746. The calculated' value t=13.317 is greater than the table value ($t_{59=}$2.01) at 0.05 level of significance. Hence the null hypothesis is rejected and research hypothesis is accepted. This shows that IEC package was effective.

Table : Area-wise mean, mean percentage, SD and 't' value showing the difference between the mean pre-test and post-test level of knowledge, n=60

Areas of knowledge	Max. possible score	Pre-test			Post-test			't' value
		Mean	SD	Mean %	Mean	SD	Mean %	
Meaning and types of healthy diet	5	3.5667	0.74485	71.33	4.7667	0.46456	95.33	11.966*
Meaning and types of junk food	6	3.5167	0.98276	58.61	4.6167	0.90370	76.945	8.352*
Harmful ingredient of junk food	5	3.1833	1.15702	63.67	4.0500	0.94645	81.00	8.724*
Health hazards of junk food	14	7.8500	2.17712	56.07	10.0000	1.89558	71.42	9.707*
Overall	30	18.167	3.655	60.56	22.76	2.746	75.89	13.317*

t_{59}=2.01 *significant

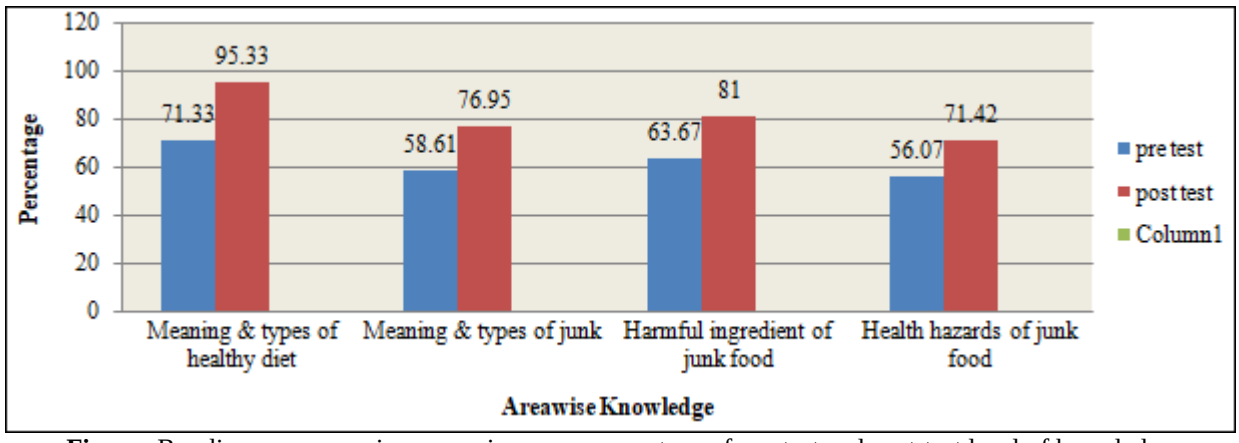

Figure: Bar diagram comparing area wise mean percentage of pre-test and post-test level of knowledge

Data in table & figure shows that in the area of meaning and types of healthy diet post-test mean percentage was 95.33, mean and SD 4.766 ± 0.464 was higher than in the pre-test, mean percentage was 71.33, with mean and SD 3.566± 0.744, calculated "t" value was 11.966. In the area of meaning and types of junk food, post-test mean percentage was 76.95, mean and SD 4.616 ± 0.903 was higher than the pre-test mean percentage 61,with mean and SD 3.516±0.982 and calculated "t" value was 8.352. In the area of harmful ingredient of junk food, the post-test mean percentage was 81.00, mean and SD 4.050±0.946, where the pre-test mean percentage was 63.67, with mean and SD 3.183±1.157 and the calculated "t" value was 8.724. In the area of health hazards of junk food, the post-test mean percentage was 71.42, with mean and SD 10.000 ± 1.895 and pre-test mean percentage was 56.07, with mean and SD 7.8500±2.177 and calculated "t" value was 9.707.

It is found that the calculated 't' value (13.317)is greater than the table 't'value (t_{59}=2.01) in all the four areas. Hence the research hypothesis is accepted and null hypothesis is rejected. This shows that IEC package was effective in all areas in improving the knowledge among mothers of school children regarding health hazards of junk food.

Section IV: Association between the level of knowledge and selected demographic variables

To find the association between the pre-test level of knowledge and selected demographic variables, null hypotheses were formulated. Chi-square test was used to find the association.

H_{02}: There is no significant association between the pre-test level of knowledge and selected demographic variables at 0.05 level of significance.

Table: Association between pre-test level of knowledge and demographic variables, n=60

S. No.	Demographic variables	Average	Good	χ^2	df	p value
1	**Age group of samples**					
	25-30	16	3	2.707	3	0.437
	30-35	9	3			
	35-40	9	5			
	>=40	13	2			
2	**Sample's educational status**					
	Primary	9	2	2.299	3	0.513
	Secondary	15	2			
	Pre university	13	4			
	Graduate & above	10	5			
3	**Husband's education**					
	No formal education	2	0	7.826	4	0.098
	Primary	14	0			
	Secondary	17	5			
	Pre-university	9	4			
	Graduate & above	5	4			
4	**Religion**					
	Hindu	39	9	1.596	2	0.45
	Christian	1	1			
	Muslim	7	3			
5	**Occupation of samples**					
	Business	0	2	8.647	3	0.035*
	Salary basis	12	3			
	Daily wages	5	0			
	Home maker	30	8			
6	**Family income per month (Rs.)**					
	<=2000	7	2	4.912	4	0.298
	2001-5000	11	0			
	5001-8000	9	2			
	8001-10000	13	5			
	>=10000	7	4			
7	**Types of family**					
	Nuclear	8	6	8.225	3	0.042*
	Joint	27	4			
	Extended	5	3			
	Single parent	7	0			
8	**Numbers of children**					
	One	14	7	4.307	3	0.23
	Two	30	5			
	Three	2	0			
	More than three	1	1			
9	**Types of food habit**					
	Vegetarian	11	3	0.001	1	0.98
	Non vegetarian	36	10			
10	**Do you provide junk food in your home?**					
	Yes	7	3	0.491	1	0.483
	No	40	10			
10.A	**How often do you provide?**					
	Daily	2	1	1.08	3	0.782
	1 – 2 times a week	4	2			
	More than 3 times a week	1	0			
	Never	40	10			
10.B	**Why you prefer junk food?**					
	Easy to provide	4	1	0.476	1	0.49
	Time saving	3	2			
11	**Do you provide school lunch for your children?**					
	Yes	47	13	-	1	-
	No	0	0	-		-
11.A	**Types of school lunch**					
	Home made	42	11	0.223	1	0.637
	Readymade	5	2			
12	**Previous information regarding hazards of junk food?**					
	Yes	47	13	-	1	-
	No	0	0			
12.A	**Source of information**					
	Mass media	24	7	4.256	3	0.235
	Health personnel	15	3			
	Neighbourhood	1	2			
	Friends & relatives	7	1			

*=significant, p<0.05

The data in table revealed that there is significant association between pre-test level of knowledge and demographic variables, i.e., occupation of samples (χ^2=8.647) and types of family (χ^2=8.225). So, the null hypothesis was rejected and research hypothesis was accepted.

There is no significant association between pre-test level of knowledge and remaining demographic variables, i.e., age group of samples, samples' educational status, husband's educational status, religion and family income, etc. So, in these subjects, the null hypothesis was accepted and research hypothesis was rejected.

To find the association between the post-test level of knowledge and selected demographic variables, null hypotheses were formulated. Chi-square test was used to find the association.

H_{03}: There is no significant association between the post-test level of knowledge and selected demographic variables at 0.05 level of significance.

Table: Association between post-test level of knowledge and demographic variables, n=60

S. No.	Demographic variables	Average	Good	χ^2	df	p value
1	Age group of samples					
	25-30	3	16	0.619	3	0.892
	30-35	3	9			
	35-40	2	12			
	>=40	3	12			
2	Samples educational status					
	Primary	2	9	2.134	3	0.545
	Secondary	5	12			
	Pre university	2	15			
	Graduate & above	2	13			
3	Husband's educational status					
	No formal education	1	1	5.836	4	0.212
	Primary	4	10			

	Secondary	5	17			
	Pre university	0	13			
	Graduate & above	1	8			
4	Religion					
	Hindu	9	39	0.473	2	0.789
	Christian	0	2			
	Muslim	2	8			
5	Occupation					
	Business	0	2	0.486	3	0.922
	Salary basis	3	12			
	Daily wages basis	1	4			
	Home maker	7	31			
6	Family income					
	<=2000	4	5	11.15	4	0.025*
	2001- 5000	4	7			
	5001- 8000	1	10			
	8001- 10000	0	18			
	>=10000	2	9			
7	Types of family					
	Nuclear	1	13	3.232	3	0.367
	Joint	6	25			
	Extended	3	5			
	Single parent	1	6			
8	Numbers of children					
	One	4	17	1.829	3	0.609
	Two	6	29			
	Three	0	2			
	More than three	1	1			
9	Types of food habit					
	Vegetarian	5	9	3.685	1	0.055
	Non vegetarian	6	40			
10	Do you provide junk food in your home?					
	Yes	1	9	0.557	1	0.456
	No	10	40			
10. A	How often do you provide?					
	Daily	0	3	1.002	3	0.801
	1 – 2 times a week	1	5			
	More than 3 times a week	0	1			
	Never	10	40			
10.B	Why you prefer junk food?					
	Easy to provide	0	5	-	1	(Fisher's Exact Test)
	Time saving	1	4			
11	Do you provide school lunch for your children?					
	Yes	11	49	-	1	-
	No	0	0			
11. A	Types of school lunch					
	Home made	10	43	0.087	1	0.768
	Readymade	1	6			
12	Previous information regarding hazards of junk food?					
	Yes	11	49	-	1	-
	No	0	0			
12. A	Source of information					
	Mass media	4	27	3.058	3	0.383
	Health personnel	3	15			
	Neighbourhood	1	2			
	Friends & relatives	3	5			

*=Significant p<0.05

The data in above Table reveals that there is significant association between post-test level of knowledge and family income (χ^2=11.15, p<0.05). Hence, the null hypothesis was rejected and research hypothesis was accepted. There is no significant association between post-test level of knowledge and demographic variables. These demographical variables are age group of samples, samples educational status, their husband's educational status, religion and type of family. So, in these subjects, the null hypothesis was accepted and research hypothesis was rejected.

5. Summary

The study was conducted to assess effectiveness of IEC package on knowledge regarding health hazards of junk food among the mothers of school children in selected urban area, Mangalore. In this study the independent variable was the IEC package and dependent variable was the knowledge of the mothers of school children regarding health hazards of junk foods and extraneous variables were age, religion, gender, educational status, income of samples and types of family. The conceptual framework of the present study was based on modified health promotion model (HPM) by Nola J Pender. The main concept of this model is that depicts the multidimensional nature of person's interacting with their interpersonal influences and physical environment as they pursue health. This model describes the three aspects or sets of variables; they are individual characteristics or experiences, behaviour-specific cognitions and affect, and behaviour outcomes. Structured knowledge questionnaire containing 30 questions was used by the investigator to assess the level of knowledge regarding health hazards of junk food among mothers of school children. Content validity of the tool was established by giving it to eleven experts. Reliability of the tool was carried out on six mothers of school children, at Gorakshandu, in Mangalore. The reliability of the split half test was established by using Karl Pearson's correlation coefficient. The **reliability** obtained was **0.79**. Hence the tool was found reliable. Using of IEC package is effective for enhancing knowledge regarding health hazards of junk foods to all persons to prevent different diseases and complications.

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