Effect of Educational Intervention Program regarding Knowledge, Attitude, and Habits of Junk Food among Primary School Students

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Abstract

Junk food is very popular in modern society and its harmful effects cannot be neglected**. The aim was to** evaluate the effect of educational intervention program regarding knowledge, attitude, and habits of junk food among primary school students. **Subjects and method: Design:** A quasi-experimental research design was utilized to fulfill the aim of this study. **Setting:** the research was conducted at two Mansura primary schools in Mansura city. **Subjects**: A multi-stages technique of purposive sample of 360 primary school students was involved in this study. **Tools for data collection:** A structured interview questionnaire which consisted of four parts; part (I) demographic characteristics of the primary school students; part (II) primary school students' knowledge regarding junk food (pre/post), part (III) primary school students' attitude regarding junk food (pre/post), and part (IV) primary school students' habits regarding junk food (pre/post). **Results**: The study result revealed that there were highly significant improvements in primary school students' knowledge, practice, and habits regarding junk food post one month of educational intervention ($P<0.001$). There was a positive significant correlation ($P=0.005$) between school-age students' knowledge scores, practice, and their habits post-one month of educational intervention program. **Conclusion:** The present study concluded that educational intervention program implementation had a positive effect on improving knowledge, attitude, and habits of junk food among primary school students**. Recommendations:** The study recommended that educational program regarding knowledge, healthy attitude and ill effects of junk food should be taught to primary school students. Replication of the current study with a larger sample of school-age students regarding junk food in different settings is required for generalizing the results.

Keywords: Educational intervention program, junk food, knowledge, attitude and habits, primary school-age students

Introduction:

Children's development, both physically and cognitively, is dependent on a good diet. Children must understand what they consume because it has an impact on their growth and conduct. Changes in our community have increased the demand for food skills to the point that they must now be included in a child's basic education to ensure optimal health. The majority of individuals in our society have forgotten that eating is primarily for nutrition and good health. Our culture is designed in many ways to encourage poor eating habits, which leads to poor health **(Harsha et al., 2019).**

Junk food is simply calorie-deficient food. An empty caloric food is high in calories but low in micronutrients such as vitamins, minerals, or amino acids, as well as fiber (calories). These foods don't provide your body with the nutrients it requires to stay healthy. As a result, these items, although have enough nutritional content, are deemed unhealthy and may be referred to as junk food. Junk food is a colloquial phrase for foods that are regarded to have little or no nutritional value yet contain substances that are deemed unhealthy when consumed regularly, or items that are considered unhealthy to consume at all **(Gopal et al., 2019).**

School-aged children are at a vulnerable and crucial stage in their lives, requiring a multidisciplinary approach to both understandings and solving their difficulties. Stopping eating junk food is the single most important dietary change you can make to improve your nutrition and natural health. Many senior folks have forgotten what real food is and what they should consume for optimum health throughout the years. Instead

of eating 100 percent home-cooked meals, they eat trash created by modern food science. Simply quit eating junk food to increase our nutrition and natural wellness. Consume fewer processed foods that are more artificial than natural. Avoid high-fructose corn syrup, saturated fat, and other processed foods that contain too much junk, like high-fructose corn syrup, saturated fat, or salt **(Ashakiran & Deepthi, 2017)**

Obesity and chronic diseases such as cardiovascular disease, type 2 diabetes, non-alcoholic fatty liver disease, and various malignancies can all be exacerbated by eating junk food daily. According to a study done among students, the increased usage of preservatives and flavoring chemicals has the potential to generate public health issues. Furthermore, it was shown that fast food accounts for 23% of student meals, with 50% of students reporting eating at least three fast-food meals per week. As a result, consuming junk food in excess can lead to major health problems in the future **(British nutrition foundation, 2020).**

Michael Jacobson, Director of the Center for Science in Washington, created the term junk food in 1972 as a public service announcement. These foods are classified as junk because they contain high levels of refined sugar, white flour, trans fat, polyunsaturated fat, salt, and numerous food additives such as monosodium glutamate and tartrazine, as well as a lack of proteins, vitamins, essential minerals, and fiber, among other healthy characteristics. These foods are deficient in enzyme-producing vitamins and minerals, yet they are high in calories. Junk food is defined as a food that is heavy in fat, sodium, and/or sugar and delivers a lot of calories but has little nutritional benefit. Junk food, on the other hand, is unhealthy, easy to carry, purchase and consume (**Lemeshow**, **2018).**

Food is one of all living beings' basic needs, and it ranks first among all basic needs. Every individual consumes food to maintain growth, development, and to live an active and healthy life. It is made up of important elements such as carbohydrates, protein, fat, and others. Junk food is a word used to describe foods that are high in calories but low in nutrients. Due to the time factor, flavor element, attractiveness, and tempting ads, these dishes are becoming increasingly popular among people. Adolescent psychological development, such as independence and peer approval, may influence food choices and nutritional intake, causing them to engage in unhealthy eating patterns, such as junk food addiction **(Rageliene and Gronhoj, 2020).**

According to a study, trade liberalization and foreign investment in the food and beverage industries have aided the growth of huge international food firms, resulting in increased consumption of unhealthy foods. To improve flavor, texture, and shelf life, junk food is usually given a very appealing appearance by adding food additives and colors **(Dharmapuri, 2016).**

These foods harm children's health. Obesity, metabolic disorders, and high cholesterol levels have all been linked to junk food consumption. In recent years, much emphasis has been placed on the prevention of different health problems associated with junk food consumption at the primary and secondary levels. As a result, it is critical to avoid the health risks associated with junk food to protect students' futures and maintain excellent health **(Bhadoria et al., 2015).**

Children's eating habits and patterns are initially influenced by family situations; however, as they spend more time away from home and the direct supervision of their parents, they may change as they enter school, as they spend more time away from home and the parents' direct supervision, and they pick up many eating habits about "what to eat" and "how to eat" from outside the home **(Ibrahim et al., 2018).**

The consumption of junk foods as snacks among children, particularly elementary school pupils, is on the rise nowadays. Changes in eating habits over the last decade have resulted in the replacement of nutritional snacks with junk food and worthless eating materials. Increased junk food intake is attributed to a growing tendency of urbanization, broad ads on television and in the media, appealing packaging, and parents' lack of nutrition understanding. Extreme consumption of these worthless nutrients suppresses hunger, depriving youngsters of the opportunity to eat the very nutritious meals cooked in the home context **(Pour Abdollahi, et al., 2018).**

On the other hand, because junk foods are heavy in sugar, salt, and fat, they contribute to the development of chronic diseases such as obesity, diabetes, and cancer in later life. Teachers, school authorities, and classmates play an important impact in children's eating materials selection and habit formation as they enter school. Out of all of these elements at school, the child's friends have a much greater influence on his or her eating habits (**Khalaj, et al., 2016).**

School is an appropriate setting for health education, and children must have sufficient knowledge, skills, attitudes, and values to promote their health. On the other hand, meals consumed during school hours are an important aspect of school nutrition education. Meanwhile, girls are more essential than boys since they will be future mothers, and nutritional concepts are primarily acquired by them at these ages, which will have long-term and irreversible consequences on their health, as well as the health of their children and families **(Antony & Bhatti, 2016).**

Given the significant link between a person's level of knowledge, attitude, and performance, it's apparent that if females don't obtain the appropriate education, they won't be able to perform well in their future assigned responsibilities, such as caring for their children and families (Vakili et al., 2017). Furthermore, given the importance and significant role of female students as future mothers, the low cost of health education activities compared to treatment activities, and the limited and similar studies on the role of education on junk food consumption and the effect of various educational methods, particularly at the primary school level, it appears necessary to set and develop an educational program **(Rovner, et al., 2016).**

Pour Abdollahi et al., (2018) did a study in Iran titled "The influence of nutrition education on the knowledge and practice of elementary school children on junk food intake," and the data revealed a clear rise in decreasing junk food intake among elementary school children.

Significance of the study:

Fast food affinity is equated with bad eating habits. Most of these quick and convenient meals contain a high amount of sodium, which increases and aggravates the risks of high blood pressure. Junk food is typically ready-to-eat convenience foods containing high levels of saturated fats, salt, or sugar and little or no fruit, vegetables, or dietary fiber and is considered to have little or no health benefits **(Sharma, 2018).**

The preventable diseases are caused mainly due to poor diet as Junk food consumption and lack of exercise could kill millions of people. The effects of Junk food include nutritional deficiency, obesity, increased cholesterol level, cardiac problems, and many other threatening health hazards. A key role of nurses is to educate the people on various aspects of the harmful effects of Junk foods in a variety of settings such as schools, colleges, community organizations, health fairs, and child care centers **(Harsha et al., 2019)**.

Aim of the study:

The study aimed to evaluate the effect of educational intervention program regarding knowledge, attitude, and habits of junk food among primary school students through:

- Assessing school-age students' knowledge regarding junk food.
- Assessing school-age students' attitude regarding junk food.
- Assessing school-age students' habits of junk food.
- Design educational intervention program regarding junk food in the light of the actual need of the study sample.
- Determine the effect of educational intervention program regarding knowledge, attitude, and habits of junk food among primary school students.

Research Hypotheses:

Primary school students' knowledge regarding junk food will be improved after implementing the educational intervention program.

Primary school students' attitude regarding junk food will be improved after implementing the educational intervention program.

Primary school students' habits regarding junk food will be improved after implementing the educational intervention program.

Subject and Methods:

Research design:

A quasi-experimental research design was utilized to fulfill the aim of this study; it identified a pre-group that is as comparable to the post-group as possible. There were differences in results between before and after groups **(Campbell and Stanley, 2015).**

Setting:

The study was conducted at two Mansura primary schools in Mansura city. These include Khalid El-Tokhiae and El-Emam Mohamed Adbo primary schools. Mansura City contained 10 primary schools. The researchers selected 20% of the total number of schools by stratified random sample which was two schools.

Subjects:

A purposive sample of 360 pprimary school students in Mansura city were the subjects of the current study who were selected based on the next inclusion criteria: Both sexes, aged from 7 up to 12 years, and willing to participate in the study. Exclusion criteria: The presence of either visual or psychological problem.

Sampling:

A multistage sampling technique was used to select the required sample size as follows:

- Four schools were randomly selected (two males and two female schools) from Mansura city
- Two random classes were chosen randomly from each school
- A purposive sample of 360 primary male and female students
- It was included in the study as elaborated in Figure 1.

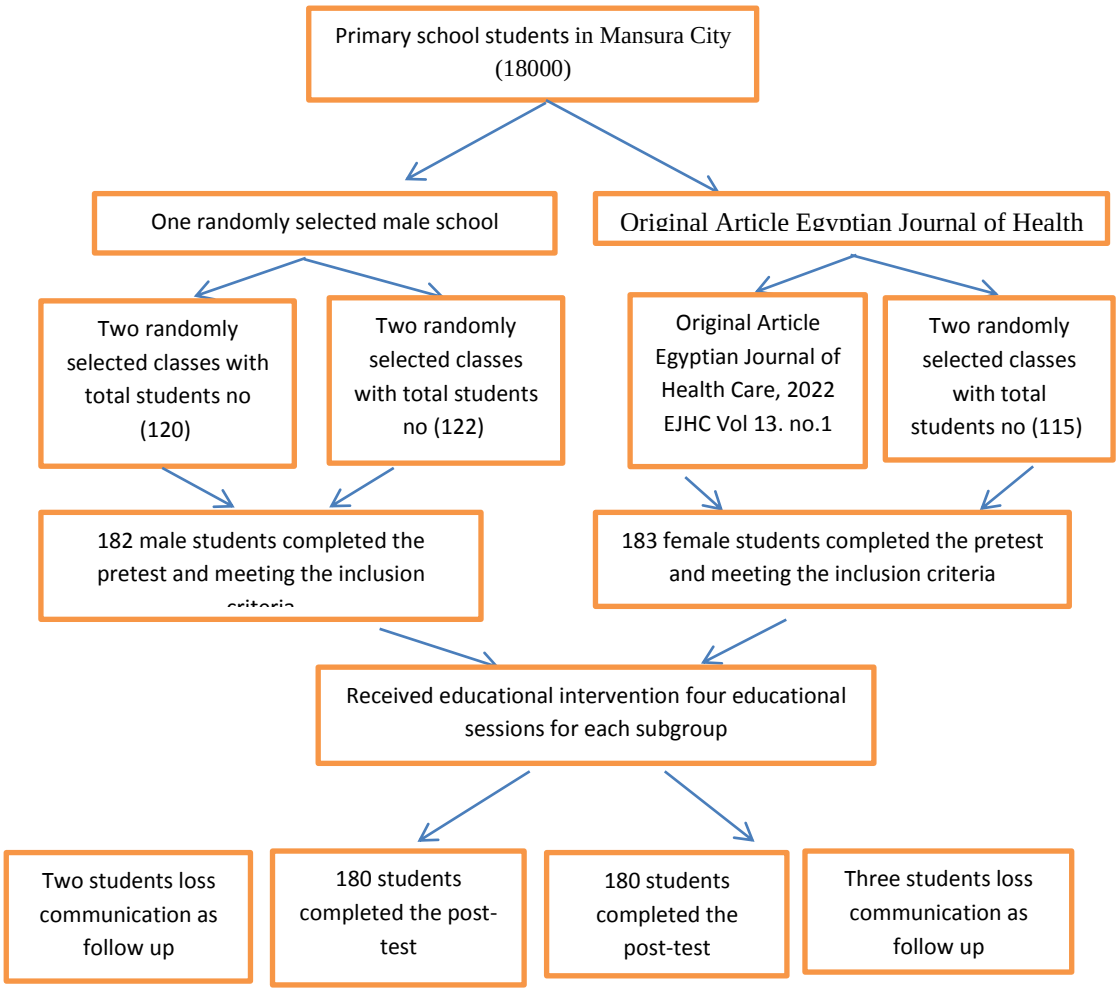

Figure 1: Graphic illustration of the studied sample flowchart

The sample size was calculated for the paired sample (before-after study) using the MedCalc software based on the following parameters: Type I error rate/two-tailed test α=(0.05), Type II error rate/β=20, Effect size (E)=0.5, SD=1 with 80% power and 95% confidence limit [27,28]. This resulted in a minimum required sample size of 327. Thus, the final sample size adopted in this study was adjusted to 360 participants to compensate for potential non-response.

Tool of data collection:-

Tool: A structured interview questionnaire: This tool was developed by the researchers after reviewing the related literature (**Pour-Abdollahi, et al., 2014, Dharmapuri, 2017, Ibrahim et al., 2018; Chalise, 2018; Rovner et al., 2018; Harsha et al., 2019)** which consisted of four parts:

Part (1): Demographic characteristics of the primary school students: It included questions regarding demographic characteristics of the students (4 questions) such as age, gender, educational level, and residence.

Part (II): Primary school students' knowledge regarding junk food (pre/post): It consisted of 12 questions (ended questions) for assessing the primary school students' knowledge regarding junk food; it included questions regarding the followings items: meaning of junk food, examples of junk food, the reason for preferring junk food, the most preferred junk foods, utilization of Junk food, harmful effects of junk food, its control and prevention, and their source of knowledge**.**

Scoring system for primary school students' knowledge about junk food: The total primary school students' knowledge was 24 marks. Each complete correct response received two marks, while an incomplete correct answer received one mark, and wrong or unknown answers received zero marks. The scores of the items were added up for each area of knowledge, and the total answers were divided by the number of items, yielding a mean score for the knowledge. The results were then transformed into a percentage score. If a primary school students' knowledge score was 60% or more, it was considered as satisfactory knowledge level; if it was less than 60%, it was considered unsatisfactory knowledge level.

Part (III): School-age students' attitude regarding junk food (pre/post): It included of (6 questions), the questions related to becoming obese if eat junk food, the taste of junk food is very good, consumption of junk food gives me pleasure, consumption of junk food gives me enough time for doing other work, junk foods are very cheap and easy to consume Junk food.

Scoring system for primary school students' attitude: It is based on the 5-items Likert scale (completely agree, agree, no idea, disagree, completely disagree), which was scored from 0-to 4. For each area, the scores of the items were summed up, and the total was divided by the number of the items, giving the mean score for the part. These scores were converted to a percentage score. Primary school students' attitude was considered positive attitude if the score was 60% or more and negative attitude if the score was less than 60%.

Part (IV): Primary School students' habits regarding junk food (pre/post): It consisted of 4 questions (ended questions) for assessing the primary school students' habits regarding junk food. It consisted of questions measuring the students' habits related to the consumption frequency of junk food, watching television during junk food consumption, and containing junk food (corn puffs, biscuit, chocolate, chips, fruit leather, soft drinks, ice drinking, ice cream, candies, Indian leather foods, chewing gum, and sour plum).

Scoring system for primary school students' habits:

The primary school students' practice habits were scored as follows; done correctly was scored (1), and the items not done or incorrectly done were scored zero. These scores were converted to a percentage score. Primary school students practice' habits were

considered good if the percentage score was 60% or more and bad if was less than 60%.

Validity of the tools:

The content validity of the tools was checked by five experts' professors in the field of community health nursing to ensure that the questions were clear, relevant, applicable, and complete. No changes were made according to the judge of experts.

Reliability of the tools:

Test-retest reliability was used. The internal consistency of the tools was calculated using Cronbach's alpha coefficients. Study tools revealed reliability at Cronbach's alpha 0.86 for the tool.

Administrative and ethical considerations:

Permission for conduction of the study was obtained from the responsible authorities after an explanation of its purpose. The researchers explained to school-age students the aim and benefit of the study. Written consent was obtained from primary school students' parents to gain their cooperation. The primary school students were informed that their participation is voluntary and have the ethical right to participate or refuse participation in the study. It was further emphasized that their responses are confidential, and had their right to withdraw from the study any time without giving further explanation.

A pilot study:

The pilot study was conducted on 10% (36 primary school students) of the entire sample to confirm that the measures were clear, that they were applicable, and that the time required to complete the survey was reasonable. School-age students who participated in the pilot study were not included in the research study.

Data collection procedure:

Field of the work:

Data collection was done by the researchers during the school day. The data is collected according to every school policy. The actual work started by meeting the school manager throughout the morning or evening school day, the researchers first introduced themselves to them and gave them a complete background about the study and the questionnaire format which was predesigned by the researchers in the Arabic language to collect the required data. Then the researchers went to the participants' classes and introduce themselves to students, explain the aim for their visits and the research aims, and invited them to participate in the study by filling out the questionnaire.

The researchers used scientific books, papers, periodicals, and the internet to analyze current local and international related literature to gain a better understanding of the problem, create the study measures, and complete them. The actual fieldwork took place at the chosen setting from the beginning of October until the end of December 2021. The researchers visited each school three to four times every week to collect the data. It was done during the routine work of the school. The participants take about 20-30 minutes to fulfill the questionnaire.

The researchers performed the study in the following phases:

1- **Assessment Phase**: The researchers met with students, introduced themselves, and obtained their consent to be recruited in the study after explaining the purpose of the study and collecting their demographic data. They also assessed students' knowledge, attitude, and habits about junk food before the educational intervention.

2- **Planning phase:** Before starting this study, formal administrative approval was taken from authorities in the setting. Permission was obtained from the ministry of education in Mansura City, with official permission from the managers of the two primary schools. The researchers prepared educational material about voluntary participation and confidentiality was assured by the researchers for each primary school student by clarifying that all information will be used for scientific research only. All the study students were subjected to the content of the educational intervention which was prepared in the light of the actual need assessment of the students.

3- Implementation phase: The researchers provided four educational sessions and a booklet regarding educational sessions. Each session is lasting from 45 minutes to 1 hour. These sessions were illustrated by using a booklet, PowerPoint, and educational videos. They were given information regarding the meaning of junk food, examples of junk food, the reason for preferring junk food, the most preferred junk foods, utilization of Junk food, benefits of reducing consumption and increasing positive attitude toward reducing consumption, eating a healthy diet, harmful effects of junk food, its control, and prevention. While, the habits sessions included consumption frequency of junk food, watching television during junk food consumption, containing junk food

After completion of the questionnaire by the studied students, the educational intervention was designed based on the pre‑test results. The educational intervention was conducted for the studied group during 1st week in 4 sessions of 45‑90 minutes. During the first session, using direct education, different types of knowledge regarding the effects of consuming too much junk food were presented via lecture and questioning after acquainting students with junk food meaning. During the second session, the content of the first session was firstly gone through, and some questions about the first session's ideas were asked. Then, the contents of the second session, including the benefits of reducing consumption and increasing positive attitude toward reducing consumption, were offended by giving lecture group discussion, asking and answering questions, and brainstorming methods.

As the third session started, questioning and group discussion were adopted, and it was followed by presenting this session's content including prevention and barriers reducing junk food consumption and ways to overcome barriers and increase self‑efficacy in students about reduced consumption of junk foods. During the fourth session, described eating healthy and beneficial foods such as fruits and vegetables, natural juices, homemade cakes, nuts. Educational slides, posters, brochures, and a whiteboard were used to help students understand the contents and avoid misunderstandings, as well as to engage their visual senses in the learning process.

- **Evaluation phase:** Reassessing the effect of the educational intervention regarding junk food on school-age students' knowledge, attitude, and habits was followed and carried out after one month by using pre and post the same tool.

Results:

A total of 360 school-age students participated in this study, **table (1)** revealed that the mean age of primary school students was 7.22 ± 3.87, the age group from 8 to < 10 years was the most prevalent (37 %); it was found that 20% of them were in fourth grade. Regarding residence, 73% of primary school students were living in the urban area.

Figure (1): Portrays that females were more than males 57% compared to 43.0%.

Figure (2): Illustrates that 79% of the studied primary school students reported that the main source of their knowledge regarding junk food was grandmothers.

Table (2): Demonstrates frequency and percentage distribution of the studied primary school students' knowledge regarding junk food. There was an improvement post the educational intervention with a highly statistically significant difference between students' knowledge regarding junk food pre/post one month of educational intervention ($P<0.001$).

Table (3) revealed that the majority of primary school students regarding junk food in the pre-educational intervention (83%) had unsatisfactory knowledge and (17%) had satisfactory knowledge levels. But, post the educational intervention, (93%) of the primary school students had satisfactory knowledge levels.

Figure (3) clarifies the total attitude scores of the primary school students regarding junk food pre and one-month post-educational - intervention. It observed that 67% of them had a negative attitude toward junk food pre-intervention and decreased to become 14% one-month post-intervention. Additionally, 33% of them had a positive attitude toward junk food pre-intervention compared to 86 % one-month post-intervention.

Figure (4) clarified the total practices score of the primary school students' pre and

one-month post-educational intervention. It was noticed that the majority of them (92%) had inadequate practices toward junk food pre-educational intervention and decreased to become 11% one-month post-intervention. On the other hand, just 8% of the primary school students had adequate practices regarding junk food pre-intervention compared to 89 % one-month post-intervention.

Table (4): Correlation revealed significant positive linear correlations between knowledge-attitude ($r = 0.445$, $p < 0.001$), knowledge-practice ($r = 0.224$, $p < 0.001$), and attitude-practice ($r = 0.223$, $p < 0.001$). This result confirms the positive relationship between knowledge, attitude, and practice regarding junk food.

Table (5): shows that the primary school students' score of knowledge before intervention was 28.94 ± 15.10, and reached 90.27 ± 8.79 one month after the intervention (P < 0.001). The results presented in the same table indicate that the primary school students' score of attitude was 20.37 ± 17.21 before the intervention, which reached 54.05 ± 13.92 one month after intervention (P < 0.001). Table 5 also, shows that the primary school students' score of habits and practice of the primary school students, was 39.86 ± 9.85 before the educational intervention that improved one month after the intervention to 50.00 ± 6.11 (P < 0.001).

The data present in this **table 6** shows the association between the knowledge regarding junk foods and their demographic variables. There was a significant association between age, education, and residence.

Table (1): Distribution of the studied primary school students regarding their demographic characteristics (n=360)

Demographic characteristics	No	%
Age:		
- 6 to < 8	119	33
- 8 to < 10	133	37
- 10 -12	108	30
Mean ± SD		7.22 ± 3.87
Educational grade		
-First grade	61	17
-Second grade	47	13
-Third grade	72	20
-Fourth grade	65	18
-Fifth grade	47	13
-Sixth grade	68	19
Residence		
- Urban	263	73
- Rural	97	27

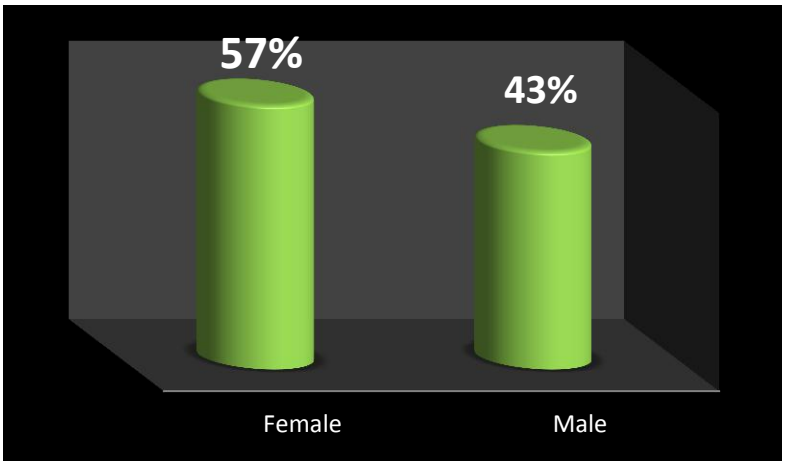

Figure (1): Distribution of the studied primary school students according to their gender (n=360)

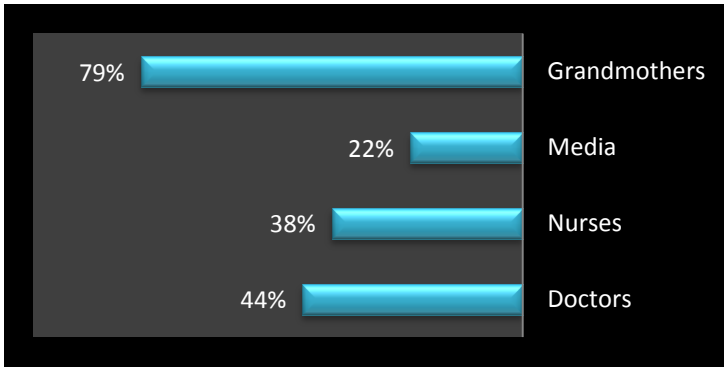

Figure (2): Distribution of the studied primary school students according to their source of knowledge regarding junk food (n=360)

Table (2): Distribution of the studied primary school-age students ' knowledge regarding junk food pre and post educational intervention

School-age students' knowledge	No =(360)		X^2	P-value
	Pre (No/%)	Post (No/%)		
Meaning of junk food	72(20)	338(94)	68.392	<0.00 1*
Examples of junk food	90(25)	331 (92)	136.44	<0.001*
Reason for preferring junk food	104 (29)	320 (89)	156.163	<0.001*
Most preferred junk foods	119 (33)	313 (87)	159.455	<0.001*
Utilization of Junk food	83(23)	324(90)	167.373	<0.001*
Harmful effects of junk food	90(25)	320(89)	142.312	<0.001*
Control and prevention	119 (33)	324 (90)	104.506	<0.001*

***highly significance at 0.001 levels** -Chi-square test

Table (3): The total knowledge score level of the studied primary school students regarding junk food pre and post educational intervention

Total knowledge	Pre educational intervention		Post educational intervention		X^2	P-value
	No	%	No	%		
Satisfactory	61	17	335	93	9.034	<0.001*
Unsatisfactory	299	83	25	7		

***highly significance at 0.001 levels** -Chi-square test

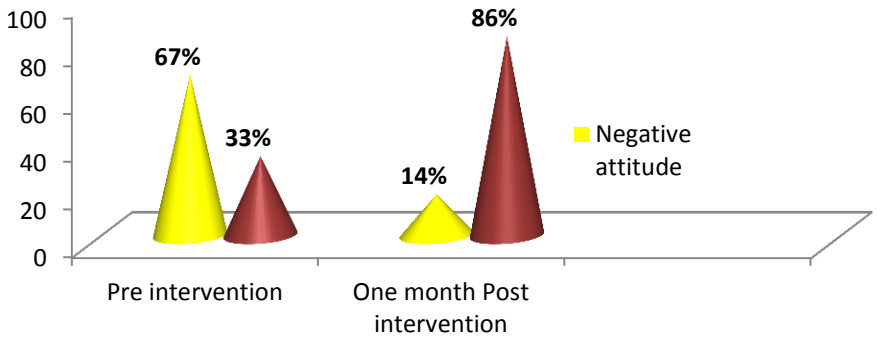

Figure (3): The total attitude score level of the studied primary school students regarding junk food pre and post-one-month educational intervention (n=360).

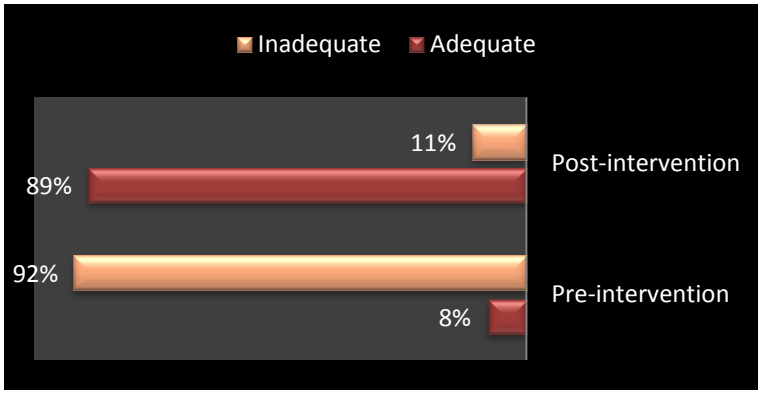

Figure (4): The total practices score level of the studied primary school students regarding junk food pre and post-one-month educational intervention (n=360).

Table (4): Correlation coefficient between total studied primary school students' knowledge, attitude, and habits scores pre and post-one-month of intervention.

Variable	Correlation coefficient	P-value*
Knowledge-Attitude	0.445	<0.01
Knowledge-habits	0.224	<0.01
Attitude-habits	0.223	<0.01

*Correlation significant at <0.001levels

Table 5: Comparison of the average scores of knowledge, attitude, and habits before and one month post the educational intervention

Intended variable	Study time	Mean±SD	Test result
Knowledge	Before the intervention	28.94±15.10	<0.001*
	one month after the intervention	90.27±8.79	
ANOVA test		<0.001*	0.320
Attitude	Before the intervention	20.37±17.21	<0.001*
	one month after the intervention	54.05±13.92	
ANOVA test		< 0.001*	0.06
Habits	Before the intervention	39.86±9.85	<0.001*
	one month after the intervention	50.00±6.11	
Test result		<0.001*	0.317

Table (6): Association between post-test knowledge regarding junk foods with selected demographic variables

Demographic characteristics	Satisfactory (n=335)	Unsatisfactory (25)	Chi-square	Level of significance
	No (%)	No (%)		
Age:				
- 6 to < 8	111(33%)	6(24%)	1.826	<0.001*
- 8 to < 10	124(37%)	13(52%)		
- 10 -12	100(30%)	6(24%)		
Educational grade				
-First grade	57(17%)	3(12%)		
-Second grade	44(13%)	3(12%)		
-Third grade	67(20%)	13(52%)	0.667	<0.001*
-Fourth grade	60(1%8)	6(24%)		
-Fifth grade	44(13%)	0		
-Sixth grade	63(1%9)	0		
Residence				
- Urban	245(73%)	6(24%)	2.695	<0.001*
- Rural	90(27%)	19(76%)		

Significant at 0.05 levels of significant

Discussion:

Junk food and processed meals appear to be becoming more prevalent in our daily diets. Unfortunately, this low nutrient, high-calorie eating practice is contributing to the obesity and diabetes epidemics by causing weight gain, high blood pressure, and high cholesterol levels. Because they are pleasant and easy to eat, many packaged and processed foods are promoted to youngsters. These foods, on the other hand, are heavy in sugar and fats and have a low nutritional value. It's critical to instill in your children the importance of eating a diverse range of whole meals and avoiding junk food. Their physical, emotional, and mental growth and development, as well as their adult years, will be influenced by these good eating habits. It might be challenging to ensure that children get a variety of nutritious foods and eat balanced meals and snacks every day, and in some cases, children will not eat enough. School‑age children need between 1,740 and 1,970 calories per day; these mustn't be empty calories from junk food. A poor diet during childhood can lead to disorders such as diabetes, heart disease, and osteoporosis or weak, brittle bones later in life **(Haris, 2018).**So, the study aimed to evaluate the effect of educational intervention regarding knowledge, attitude, and habits of junk food among school-age students

The results of the present study revealed that there was an improvement with a highly statistically significant difference between students' knowledge regarding junk food pre/post one month of educational intervention ($P<0.001$). From the researchers' point of view, this result is reflected in the positive effect of educational intervention on improving students' knowledge regarding junk foods intake.

These findings are in the same line with results in a study conducted by **Fatehi et al., (2015)** who studied" Effect of promotional training program to reduce the consumption of fast food" on the fifth-grade elementary school girls and reported that students had a lack of nutritional information regarding fast meals and their dangers; nevertheless, after education, the students in the intervention group's attitude scores considerably improved.

The present study result is in agreement with **Lee, et al., (2018)** who conducted her study in South Korea to compare nutrition knowledge, dietary attitude, and dietary habit in elementary school children with and without nutrition education and found that education had a significant effect on improving knowledge, attitude, and nutritional behavior and the results indicated that educational programs and more attention in elementary students are required due to lack of children's nutritional knowledge.

A similar study was done by **Mishra et al., (2021)** about "Effect of educational intervention on awareness regarding health hazards of junk food consumption among engineering students" indicated an improvement in knowledge score after implementation of Educational Intervention on awareness regarding health hazards of junk food consumption.

Similar findings were reported by studies conducted by **Ramachandra et al., (2015)** who studied " Knowledge regarding health hazards of junk foods among adolescents "and **Yadav et al., (2019)** who done a study about" Knowledge Regarding Health Hazards of Junk Food and Its Prevention Among Adolescents " that showed improvement in knowledge score after the educational intervention.

The results of the present study indicated that the majority post the educational intervention of the primary school students had satisfactory knowledge levels. These findings are in agreement with the results obtained from the similar studies conducted by **Choobineh et al., (2019)** who conducted a study entitled " nutritional knowledge of Ahwaz high school girls and the education effect " and **Mazloomi et al., (2019)** who studied" Effect of role modeling through theater show in oral health education" and the results illustrated that the students' knowledge regarding the junk foods intake after the intervention has increased significantly; this finding suggests that education has a positive impact on students' knowledge of junk food consumption.

The findings of the present study revealed that one-month post-intervention majority of primary school students had a positive attitude

toward junk food. These findings are in agreement with the results obtained from the similar studies conducted by **Poor Abdollahi, et al., (2014)** who studied " The effect of nutrition education on the knowledge and practice of elementary school children regarding junk food intake " as well as **Hosseini et al., (2016)** who performed a study about " educational intervention on knowledge, attitude, practice about iron deficiency anemia in female adolescent students" and they found that the students' attitude regarding the junk foods intake after the intervention has improved after education.

Similarly, **Heidari et al., (2013)** found in their study about "Efficacy of education on knowledge, attitude and practice of type II diabetic patients concerning correct nutrition " that nine months after the intervention, the researchers observed a significant increase in the participant's knowledge and attitude towards the fruits intake.

Concerning the total practices score of the primary school students' pre and one-month post-educational intervention. It was noticed that the majority of them had adequate practices regarding junk food one month post-intervention. These findings are supported by the results obtained from a similar study conducted by **Vakili et al., (2017)** who studied "Assessing the effect of education on knowledge, attitude and practice of guidance school students about milk and dairy products" and found that the students' performance regarding the junk foods intake after the intervention has improved significantly after the education.

This result is matched with **Blom-Hoffman et al.**, **(2014)** who studies " Promoting healthy food consumption among young children: Evaluation of a multi-component nutrition education program " and confirmed the positive effect of education on the students' eating knowledge and performance.

The findings of the present study revealed that significant positive linear correlations were found between knowledge-attitude, knowledge-practice, and attitude-practice. From the researchers' point of view, this reflects the importance and effectiveness of an educational intervention that is commonly associated with improving knowledge and a better understanding among the studied students and practices to help them learn and acquire good knowledge and apply it. This association is explained by that when primary school students had sufficient knowledge that can help them practice well which reflected on their attitude.

The present study results revealed that the primary school students' scores of knowledge, attitude, habits, and habits have been improved one month after the intervention and indicated a significant difference between mean pre and post-test knowledge scores which shows the effectiveness of the educational intervention. Similar findings are reported by **Yadav & Kaur, (2019) and Mishra & Ghosh, (2020)** who suggested in their findings that interventions are needed to help students to transform their knowledge into healthy eating behavior thereby maintaining a healthy lifestyle.

The present result showed that there was an association between the knowledge regarding junk foods and their demographic variables. Similarly to the present study findings, the study conducted by **Amoldeep, (2017)** entitled "Effectiveness of planned teaching program on knowledge regarding harmful effects of junk food among adolescents "reported that there was a significant association between age and educational status with pre-test knowledge scores regarding junk foods.

On the other hand, **Yadav & Kaur (2019)** who conducted a study about " Knowledge Regarding Health Hazards of Junk Food and Its Prevention Among Adolescents "reported that there is no significant association between knowledge score and selected demographic variables.

The findings of the present study have supported the aim and hypothesis of the study and the knowledge, attitude, and habits among the studied primary school students have improved regarding junk food. From the researchers' point of view, this is reflected in the success of the educational intervention and its positive effects.

This result is congruent with that of a study performed by **Shabanian et al., (2018)** in Tehran who conducted about " Effect of Health Education on the Knowledge, Attitude, and Practice of Fast Food Consumption among Primary Students " and found an increasing awareness of educational health in terms of knowledge, attitude, and practice is effective in the reduction of fast food consumption in primary students.

Similary, **Vakili, et al., (2018)** found a significant difference in the mean scores of students' knowledge, attitude, and nutritional behavior on milk and dairy products after applying an educational intervention, indicating the usefulness of educational interventions for students.

Conclusion:

Based on the findings of the current study, aim, and hypotheses, it was concluded that the majority of primary school students had unsatisfactory knowledge, a negative attitude, and inadequate habits toward junk food pre-educational intervention while improving after the educational intervention. Also, the present study concluded that educational intervention had a positive effect on improving knowledge, attitude, and habits of junk food among primary school-age students.

Recommendations:

Based on the findings of the present study, the following recommendations were suggested:

- Community health nursing plays an important role in providing continuous health educational program regarding knowledge, healthy attitude, and harmful effects of junk food that should be taught to school-age students.
- Replication of the current study with a larger sample of primary school students regarding junk food in different settings is required for generalizing the results.
- Creating the right attitude and beliefs about fast food consumption play an important role in improving the health of students that this should be in educational priorities of the health sector and the role of media in this context should also be seriously considered.
- The community and schools have to conduct as well as implement the program for awareness regarding the bad effects of consuming junk foods.
- Future research about harmful effects of junk food among children and comparison study between adult and children ' knowledge and practice regarding junk food.

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