Effect of health education about healthy diet, physical activity and personal hygiene among governmental primary school children (11-13 years old) in Sharkia Governorate-Egypt

Abd El- Lateef S. Ali; Howaida H. Fahmy; Shereen E. Mohamed; Lamiaa L. El Hawy

Departments of community medicine, environment and occupational medicine, Faculty of Medicine, Zagazig University, Egypt.
kareemmohamed1013@yahoo.com

Abstract: Nutrition and physical activity are important components for elementary school children to have healthy lifestyles. Personal hygiene is considered a public health tool that is used to prevent disease and promote health. Children in the primary schooling age can learn specific health-promoting behaviors. This research was done to determine the level of knowledge, attitude and practice about healthy diet, physical activity and personal hygiene and to assess the effect of health education intervention about healthy nutrition, physical activity and personal hygiene on knowledge, attitude and practice among primary school children. The study was carried out governmental primary schools in Sharkia governorate during academic year (2015-2016) on 384 students (191in interventional-193 control group) randomly selected by multistage random sampling technique from governmental primary schools in Sharkia governorate. This study was carried out in three stages **1st stage: pre-intervention stage**: The tool used to collect data was modified an interview questionnaire about Socio-demographic characteristics, Knowledge, attitude and practice about healthy diet, physical activity and personal. **2nd stage: intervention stage:** Student (in intervention group) were given educational sessions about Healthy diet, Physical activity and personal hygiene. **3rd stage: the post-intervention stage:** After 3 months of intervention the same data was collected and comparing the effect of health education intervention about healthy diet, physical activity and personal hygiene between interventional and control groups. There was a lack of knowledge, relatively accepted attitude and poor practice about healthy diet, physical activity and personal hygiene among the studied sample. There was statistically significant improvement in all items concerning knowledge, attitude and practice about healthy diet, physical activity and personal hygiene ($P< 0.001$) among intervention group compared to control one. In conclusion: There was a lack of knowledge, attitude and practice about healthy diet, physical activity and personal hygiene among the studied sample. Health education intervention program among governmental primary school children (11-13 years old) was an effective method for raising their knowledge, improving their attitude and practice about healthy diet, physical activity and personal hygiene.

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Keywords: health education, healthy diet, physical activity and personal hygiene and governmental primary school

1. Introduction

"Health is Wealth" is a well-known statement. In simple words, the meaning of health is the physical well-being of an individual. Health education aims to bring about behavioral changes in the individuals attitude toward health. ***(Raj, 2009).*** Perfect health is an important requisite for any individual or any family. Optimum health is the highest level of health attainable by the individual. Positive health is striving for preservations and improvements of health. Negative health is scientific efforts for prevention and cure of diseases. Important factors for cultivation of health are: environment conducive for healthful living, healthy balanced diet, adequate physical activity and rest as per individual needs ***(Asha, 2013).*** Children in the primary schooling age can learn specific health-promoting behaviors; even if they do not completely understand the connections between illness and behavior. Healthy habits can be developed in this period ***(Sarkar, 2013).*** Pre-adolescent children are the most active part of the society, yet there remains concern that many children of this age group have physical activity levels lower than those recommended for good health ***(Townsend et al., 2012).*** In Egypt, the school children are at risk to a range of health problems that may affect them immediately as infectious diseases, accidents, malnutrition or sexually transmitted diseases and in the future as cardiovascular diseases and cancers. These health problems may originate as a result of unhealthy life style ***(Sahar et al., 2011).*** Nutrition and physical activity are important components for elementary age children to have healthy lifestyles ***(Thompson et al., 2013).*** Overweight and obesity can persist over time within childhood until adulthood ***(Dreyhaupt et al., 2012).*** Poor health among school children is resulted

from lack of awareness of the health benefits of personal hygiene ***(Sarkar, 2013).*** Good personal hygiene forms a very important part of primary health prevention strategy, which has been found to be effective by decreasing morbidity and mortality among children ***(Ahmadu et al., 2013).*** Children in the primary schooling age can learn specific health-promoting behaviors; even if they do not completely understand the connections between illness and behavior.Healthy habits can be developed in this period ***(Sarkar, 2013).***

Objectives: 1-To determine the level of knowledge, attitude and practice about healthy nutrition, physical activity and personal hygiene among primary school children. 2 -To assess the effect of health education intervention about healthy diet, physical activity and personal hygiene on knowledge, attitude and practice among primary school children.

2. Subjects and Methods

Study design and sampling:

A representative sample was drawn from governmental primary school children in Sharkia governorate. Multistage random sampling technique was used as follows: **1st stage:** Sharkia governorate was classified into18 educational districts containing different rural and urban governmental primary schools by (simple random) two districts were randomly selected (**Zagazig West educational district and Al-Knayat educational district). 2nd stage:** Taking proportion allocation in consideration as:

- Number of Students at 6th grade in Zagazig West **educational** district was **(6028**) students and in Al-Knayat **educational** district were **(4349**) students.
- -Ratio of rural and urban primary schools in each district was **1:1.**

So from each **educational** district, two rural and two urban governmental primary schools were randomly selected then one school was randomly selected to be in interventional group and the other to be in control group. In **Zagazig West educational district**, two randomly selected rural schools were **Al-Ashraf school** (interventional group) and **Al-Nakhas school** (control group) and two randomly selected urban schools were **Abd El-Aziz Ali School** (interventional group) and **Al-Hekma school** (control group). **In Al-Knayat educational district**, two randomly selected rural schools were **Dr-Mohamed Al-Salhy School** (interventional group) and **Abo-Hegab school** (control group) and two randomly selected urban schools were **Al-Whda schoo**l (interventional group) and **AL- Naser 3 school** (control group). m**3rd stage:** Each school consists of classes, from 6th grade classes, one class (as a cluster) was randomly selected**.**

Inclusion criteria: Students at 6thgradeare not suffering from any chronic disease as cardiac or renal diseases to understand the questionnaire and to be easy to read and answer it by them. **Exclusion criteria:** Students who are at (1st - 5th) grade andStudents at 6th grade who are suffering from any chronic diseases.

Sample size: By assuming improvement rate in the intervention group is **15%** in weighted score(healthy nutrition and physical activity), compared with **5.3%** in controls **(Céspedes et al., 2009**) at **95%** CI and power **80%**, the sample was (**344)** and with **10%** non-response rate, the sample was (**378)**. It was calculated by Epi-info software version 6.04.

Table (1) showing numbers of students in each group

group / school	interventional group		control group	
	Name	**No**	**Name**	**No**
rural schools	**1- Dr-Mohamed Al-Salhy School** **2- Al-Ashraf school**	**42** **50**	**1-Abo-Hegab school** **2- Al-Nakhas school**	**41** **55**
urban schools	**1- Al-Whda school** **2- Abd El-Aziz Ali school**	**43** **56**	**1- AL- Naser 3 school** **2- Al-Hekma school**	**42** **55**
Total		**191**		**193**

Study description and tools: The study was done through three stages, but firstly, health status of children was assessed by asking student about past history of chronic diseases and from health insurance files to exclude any student suffering from any chronic disease. The data was collected by an interview questionnaire used in the study which carried out as follows:

- **First stage: pre-test or pre-intervention stage to all groups: An interview questionnaire:** included questions about: Socio-demographic characteristics: using the updated scale for assessing the socio-economic status **(El-Gilany *et al., 2012)*** after its modification.Knowledge, attitude and practice about healthy diet: using (***Nutrition Education Survey, 2008)*** and Survey on Diet of Students (For Students) (***Assessment of Dietary Pattern in Primary Schools 2008***) after its modification. Knowledge, attitude and practice about physical activity using: Eat Well, Be Active Nutrition Questionnaire (***Wilson et***

al., 2008) after its modification .Knowledge and practice about personal hygiene using: (***Kaur and Kamur's Personal Hygiene Survey, 2010)*** and (***Vivas et al., 2010***) after its modification.

- **Second stage: intervention stage (to interventional group only): Message**: Students were given educational sessions about: Healthy diet, types of healthy food, importance of healthy food intake and complication of unhealthy food intake. Food pyramid, its groups and serving of each group. Physical activity, its types, its duration, its benefits for them and what kind of physical activity suitable for them. Physical activity pyramid, its levels, duration of each level and activities of each level. Components of personal hygiene (hand, mouth, hair and body hygiene). Personal hygiene, its benefits for them and how to care of themselves.

Methods: 1- Lectures using teaching aids, such as: data show and board.2- Booklets which facilitated the educational process. **Place:** The educational sessions were given in class room of schools **Time:** Each educational session lasted for about 30 minutes every week for 3 weeks. The whole course of intervention stage lasted for about one months.

- **Third stage: post- test or post-intervention stage to all groups:** Post intervention: After 3 months of intervention the same data was collected as pre intervention.

Data management:

Scoring of data:

➢ **scoring of socio- economic status:**

- Total scoring of the following 7 domains (cultural - family - Economic - Occupation - Family possessions - Home sanitation - Health care) were done.
- Socio-economic level was modified and classified into: score less than 50% (low), score 50%- less than 75% (moderate) and score 75% and more (high)

➢ **scoring of questions about knowledge of healthy diet, physical activity and personal hygiene:**

- Questions which permit more than one answer were coded as follow: 2 degree for complete Right answer. 1 degree for incomplete Right answer. Zero degree for Wrong answer or don't know.
- Other questions, only one answer was correct so: 1 degree for Right answer. Zero degree for Wrong answer or don't know.

➢ ***Scoring of attitude questions about healthy diet, physical activity and personal hygiene:*** Questions were coded as follow: Irrelevant, equal zero degree. Strongly disagree, equal one degree. Disagree equal two degrees. Agree, equal three degrees. Strongly agree equal four degree.

- Except 2 questions:

I. Physical activity question was: computer games are healthier than practice of physical activity.

II. Personal hygiene question was: it is sufficient to wash our hands by water only.

- Coding of these 2 questions was as follow: Irrelevant, equal zero degree. Strongly agree, equal one degree. Agree, equal two degrees. Disagree, equal three degrees. Strongly disagree, equal four degrees.

➢ ***Scoring of practice questions about healthy diet:***

- Last week how many days did you take the breakfast before going to school? Coding of the answer was as follow: I don't take the breakfast at home or one day, equal zero degree. 2 or 3 days, equal one degree.4 or every day, equal two degrees.
- Did you take the breakfast today at home? Coding of the answer was as follow: No, equals zero degree. Yes, equal one degree.
- How many times per day did you eat this type of food during last week? Coding of the answer was divided into two parts according to type of food as follow: Fruits, vegetables, dairy product, protein food and grains: 2 or more than 2 times per day, equal two degrees. One time per day, equal one degree. Less than One time per day or no time per day, equal zero degree. Fried food, soft drinks like cola, sweets like chocolate and chips: 2or more than 2 times per day, equal zero degree. One time per day, equal one degree. Less than One time per day or no time per day, equal two degrees.
- The total score of all items of practice of healthy diet was classified into adequate score **(≥60%** of total score), and inadequate score **(< 60%** of total score) according to (**Serra-Majem et al., 2004)** after its modification**.**

➢ ***Scoring of practice questions about physical activity:***

- during last week how many days did you do physical activity practice like fast walking (running) or bicycling for period not less than 30 mints per day? Coding of the answer was as follow: No days, equal zero degree.1or 2 days, equal one degree.3 or 4 or every day, equal two degree. Do you play any sport? No, equal zero degree. Yes, equal one degree.
- How many hours do you watch TV or use computer, tablet or I pad during your usual day? Coding of the answer was as follow: I do not watch, equal zero degree. More than 2 hours, equal one degree. Less than 2 hours, equal two degrees.
- The total score of all items of practice of physical activity classified as adequate score **(≥60%** of total score), and inadequate score **(< 60%** of total score) according to **median** of our study**.**

➢ ***Scoring of practice questions about personal hygiene:***

Questions were coded as follow: Never equals zero degree. Sometimes, equal one degree. Often, equal two degrees. Always, equal three degrees.

- The total score of all items of practice of personal hygiene was classified as adequate score **(≥75%** of total score), and inadequate score **(< 75%** of total score) according to (**Ariyaratne et al., 2013)** after its modification

➢ ***Scoring of percent of change of total knowledge, attitude and practice of healthy diet, physical activity and personal hygiene:***

Percent of change was calculated as follow: [(posttest-pretest)/pretest]*100

Then data was classified into low and high percent of change according to **median of studied group.**

Statistical analysis:

After the study was completed the collected data were recorded then presented and analyzed by using SPSS version 19.0. Data were analyzed, as descriptive analysis, frequency distribution and cross-tabulation. Mc Nemar test, Chi square test and Chi- square for trend were used to test significance .The results were considered statistically significant when the significant probability (P <0.05).

Administrative technique

An official permission was taken from Faculty of medicine Zagazig University to Sharkia educational discrete then from each districts, permission was taken to each school. The title and objectives of this study was explained to them to ensure their cooperation.

Ethical consideration:

- The local authority of both rural and urban governmental primary school was informed about the nature and steps of the study.
- The study participants were informed about the nature and the purpose of the study and verbal consent was taken before interview and had not been exposed to any harms or risk.
- Participant data was confidential.

3. Results

Some characteristics of the studied sample: the present study was composed of 384 students, (191) of them in intervention group and (193) in control group. (50.0%) of them were 11to12 years old, (51.6%) were female; about half of them were of moderate socioeconomic level and from rural residence **(Table 1)**. ***Healthy diet***: There was a statistically significant improvement in all items concerning knowledge, attitude and practice about healthy diet (P< 0.001) **(Table 2).** However**,** there was no statistically significant improvement in knowledge, attitude and practice of healthy diet among control group **(Table 3).** The majority of the studied sample (**74.0%)** did not eat breakfast (**Figure *1).*** The main causes of not eating breakfast were no time **(39%)** then no desire (**31.0%) (Figure *2).*** There was improvement in percent of change of total knowledge score by **(57.10%),** then total attitude score by **(52.90%)** and lastly total practice score by **(50.80%)** about healthy diet **(*Figure 3)***.

Physical activity*:** There was statistically significant improvement in all items concerning knowledge, attitude and practice about physical activity (P< 0.000) **(Table 4).** There was no statistically significant improvement in knowledge, attitude and practice of physical activity among control group **(Table 5).** The present study showed that the majority of the studied sample (**87.20%)** did not play any sport **(*Figure 4). ***T***he main type of sport played by studied sample was football (**61.20%) (*Figure 5).*** There was improvement in percent of change of total attitude score by **(55.0%)** then total knowledge score and total practice score which were **(50.80%)** about physical activity **(*Figure 6)***.

Personal hygiene: There was statistically significant improvement in all items concerning knowledge, attitude and practice about personal hygiene (P< 0.001) **(Table 6)** but There was no statistically significant improvement in knowledge, attitude and practice of personal hygiene among control group and **(Table 7).** The high percent of change of total score of attitude was **(60.70%)** followed by total score of knowledge **(57.60%)**, and lastly of total practice score which was **(54.50%)**.

Table (1) some characteristics of the studied sample:

Variables	No (384)	%
Age (years):		
• 11-	192	50.0
• 12-	183	47.7
• 13-	9	2.3
sex:		
• Male	186	48.4
• Female	198	51.6
Social class:		
• Low	141	36.7
• Moderate	193	50.3
• High	50	13.0
Residence:		
• Rural	185	48.2
• Urban	199	51.8

Table (2): Changes of knowledge, attitude and practice about healthy diet after application of health education sessions among the intervention group:

Variables	Pre-intervention		Post- intervention		P
	No.(191)	%	No.(191)	%	
Knowledge about:					
1-Healthy diet and nutrition:					
• Adequate	46	24.1	187	97.90	0.000*
• Inadequate	145	75.9	4	2.09	
2-Food pyramid:					
• Adequate	2	1.047	187	97.90	0.000*
• Inadequate	189	98.95	4	2.09	
Attitude to:					
1-Component, Breakfast and Dairy product:					
• Positive attitude	160	83.77	187	97.9	0.000*
• Negative attitude	31	16.32	4	2.10	
2-Fruits and Vegetables:					
• Positive attitude	177	92.67	188	98.43	0.001*
• Negative attitude	14	7.33	3	1.57	
3- Unhealthy diet:					
• Positive attitude	135	70.68	182	95.29	0.000*
• Negative attitude	56	29.32	9	4.71	
Practice of:					
1-Eating breakfast:					
• Good practice	42	21.99	187	97.90	0.000*
• Bad practice	149	78.01	4	2.10	
2-Eating healthy diet:					
• Good practice	157	82.19	186	97.38	
• Bad practice	34	17.80	5	2.62	0.000*
3-Eating unhealthy diet:					
• Good practice	15	7.85	172	90.05	0.000*
• Bad practice	176	92.15	19	9.95	

*** Statistically Significant**

Table (3): Changes of knowledge, attitude and practice about healthy diet among the control group without any intervention

Variables	Pre-test		Post-test		P
	No.(193)	%	No.(193)	%	
Knowledge about:					
1-Healthy diet and nutrition:					
• Adequate	36	18.7	36	18.65	1.000
• Inadequate	157	81.3	157	81.35	
2-Food pyramid:					
• Adequate	2	1.03	2	1.036	1.000
• Inadequate	191	98.96	191	98.96	
Attitude to:					
1-Component, Breakfast and Dairy product:					
• Positive attitude	165	85.49	165	85.49	
• Negative attitude	28	14.5	28	14.51	1.000
2-Fruits and Vegetables:					
• Positive attitude	178	92.23	178	92.27	
• Negative attitude	15	7.77	15	7.77	1.000
3- Unhealthy diet:					
• Positive attitude	123	63.73	125	64.77	0.500
• Negative attitude	70	36.27	68	35.23	
Practice of:					
1-Eating breakfast:					
• Good practice	56	29.01	57	29.53	1.000
• Bad practice	137	70.98	136	70.47	
2-Eating healthy diet:					
• Good practice	164	84.97	164	84.97	1.000
• Bad practice	29	15.03	29	15.03	
3-Eating unhealthy diet:					
• Good practice	22	11.39	22	11.40	1.000
• Bad practice	171	88.60	171	88.60	

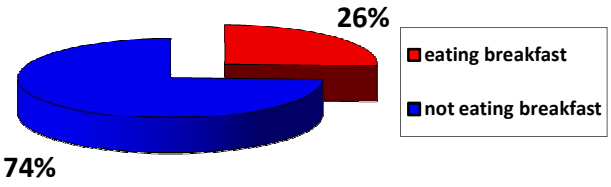

Figure (1) pie diagram showing pattern of eating breakfast:

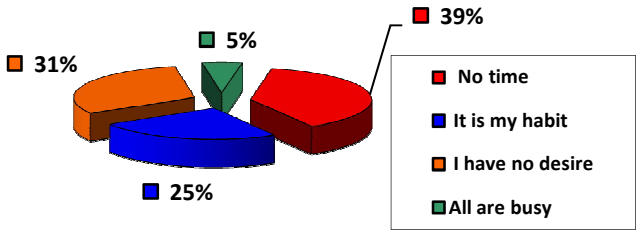

Figure (2) pie diagram showing causes of not eating breakfast:

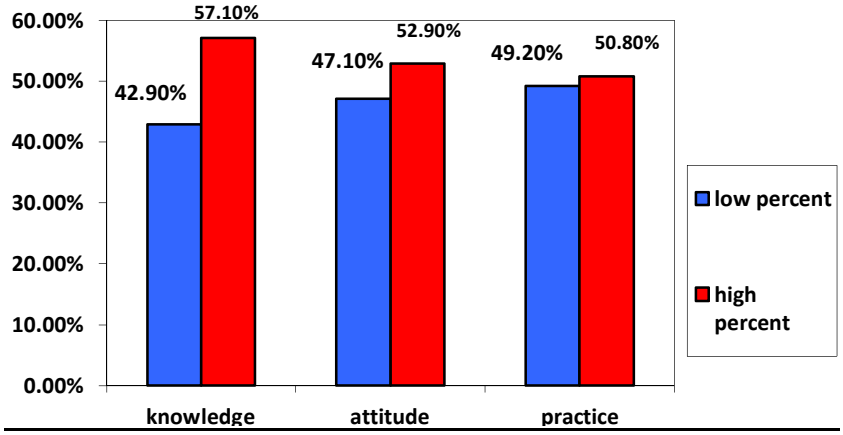

Figure (3) Bar chart showing percent of change of total score of knowledge, attitude and practice of healthy diet among intervention group:

Table (4) Changes of knowledge, attitude and practice about physical activity after application of health education sessions among the intervention group:

Variables	Pre-intervention		post- intervention		P
	No.(191)	%	No.(191)	%	
Knowledge about:					
1-Physical activity: def., benefits and harms(being in active):					
• Adequate	82	42.93	188	98.43	
• Inadequate	109	57.07	3	1.57	0.000*
2-Physical activity practice:					
• Adequate	6	3.14	188	98.43	0.000*
• Inadequate	185	96.86	3	1.57	
3-Physical activity pyramid:					
• Adequate	3	1.57	188	98.43	0.000*
• Inadequate	188	98.43	3	.1.57	
Attitude to:					
1-Benefit of Physical activity:					
• Positive attitude	170	89.01	183	95.81	0.000*
• Negative attitude	21	10.99	8	4.19	
2- Physical inactivity:					
• Positive attitude	130	68.06	179	93.72	0.000*
• Negative attitude	61	31.94	12	6.28	
Practice of:					
1- Physical activity and any sport:					
• Good practice	57	29.84	161	84.29	0.000*
• Bad practice	134	70.16	30	15.71	
2- Watching TV and playing on computer:					
• Good practice	18	9.42	127	66.49	0.000*
• Bad practice	173	90.58	64	33.51	

*** Statistically Significant**

Table (5) Changes of corrected knowledge, attitude and practice about physical activity among the studied group without any intervention:

Variables	Pre-test		post-test		P
	No. (193)	%	No. (193)	%	
Knowledge about:					
1-Physical activity: def., benefits and harms(being in active):					
• Adequate	72	37.31	72	37.31	
• Inadequate	121	62.69	121	62.69	1.000
2-Physical activity practice:					
• Adequate	10	5.18	10	5.18	1.000
• Inadequate	183	94.82	183	94.82	
3-Physical activity pyramid:					
• Adequate	4	2.07	4	2.073	1.000
• Inadequate	189	97.93	189	97.93	
Attitude to:					
1-Benefit of Physical activity:					
• Positive attitude	159	82.38	159	82.38	1.000
• Negative attitude	34	17.62	34	17.62	
2- Physical inactivity:					
• Positive attitude	114	59.07	115	59.59	1.000
• Negative attitude	79	40.93	78	40.41	
Practice of:					
1- Physical activity and any sport:					
• Good practice	55	28.50	55	28.50	1.000
• Bad practice	183	71.50	183	71.50	
2- Watching TV and playing on computer:					
• Good practice	23	11.92	25	12.95	
• Bad practice	170	88.08	168	87.05	0.500

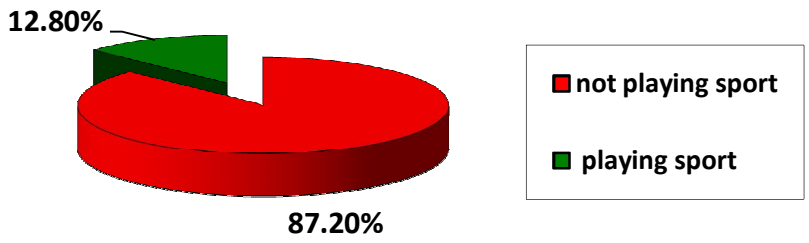

Figure (4) pie diagram showing pattern of playing sport among studied sample:

Figure (5) pie diagram showing types of sport played by studied sample:

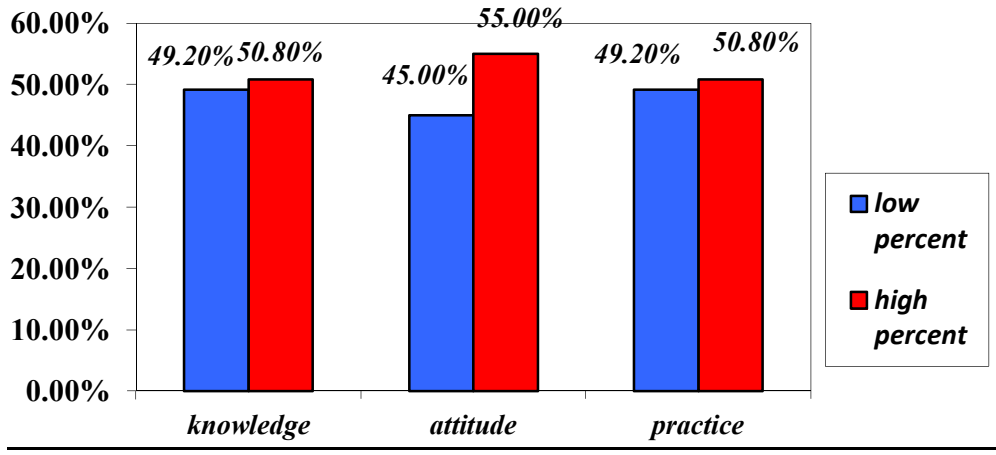

Figure (6) Bar chart showing percent of change of total score of knowledge, attitude and practice of physical activity among intervention group.

Table (6) Changes of knowledge, attitude and practice about personal hygiene after application of health education sessions among the intervention group:

Variables	Pre-intervention		post- intervention		P
	No. (191)	%	No. (191)	%	
Knowledge about:					
1-Types of personal hygiene:					
• Adequate	27	16.46	165	86.39	0.000*
• Inadequate	164	83.54	26	13.61	
2-Hand hygiene:					
• Adequate	26	13.61	187	97.91	0.000*
• Inadequate	165	86.39	4	2.09	
3-Oral hygiene:					
• Adequate	12	6.28	161	84.29	0.000*
• Inadequate	179	93.72	30	15.71	
4- Body and hair hygiene:					
• Adequate	20	10.47	174	91.10	0.000*
• In adequate	171	89.53	17	8.90	
Attitude to:					
1-Importance of personal hygiene and oral hygiene:					
• Positive attitude	163	85.34	183	95.81	0.000*
• Negative attitude	28	14.66	8	4.19	
2- Hand hygiene:					
• Positive attitude	143	74.87	179	93.72	0.000*
• Negative attitude	48	25.13	12	6.28	
3- Body and hair hygiene:					
• Positive attitude	116	60.73	179	93.72	0.000*
• Negative attitude	75	39.27	12	6.28	
Practice of:					
1- Hand hygiene:					
• Good practice	55	28.80	183	95.81	0.000*
• Bad practice	136	71.20	8	4.19	
2- Oral, body and hair hygiene:					
• Good practice	36	18.85	182	95.29	0.000*
• Bad practice	155	81.15	9	4.71	

*** Statistically Significant**

Table (7) ***Changes of knowledge, attitude and practice about personal hygiene among the control group without any intervention:***

Variables	Pre-test		post-test		P
	N0. (193)	%	No. (193)	%	
Knowledge about:					
1-Types of personal hygiene:					
• Adequate	24	12.44	25	12.95	1.000
• Inadequate	169	87.56	168	87.05	
2-Hand hygiene:					
• Adequate	20	10.36	20	10.36	1.000
• Inadequate	173	89.64	173	89.64	
3-Oral hygiene:					
• Adequate	23	11.92	23	11.92	1.000
• Inadequate	170	88.08	170	88.08	
4- Body and hair hygiene:					
• Adequate	22	11.40	22	11.40	1.000
• In adequate	171	88.60	171	88.60	
Attitude to:					
1-Importance of personal hygiene and oral hygiene:					
• Positive attitude	167	86.53	169	87.56	0.500
• Negative attitude	26	13.47	24	12.44	
2- Hand hygiene:					
• Positive attitude	136	70.47	136	70.47	1.000
• Negative attitude	57	29.53	57	29.53	
3- Body and hair hygiene:					
• Positive attitude	135	69.95	135	69.95	1.000
• Negative attitude	58	30.05	58	30.05	
Practice of:					
1- Hand hygiene:					
• Good practice	42	21.76	45	23.32	0.250
• Bad practice	151	78.24	148	76.68	
2- Oral, body and hair hygiene:					
• Good practice	35	18.13	40	20.73	0.063
• Bad practice	158	81.87	153	79.27	

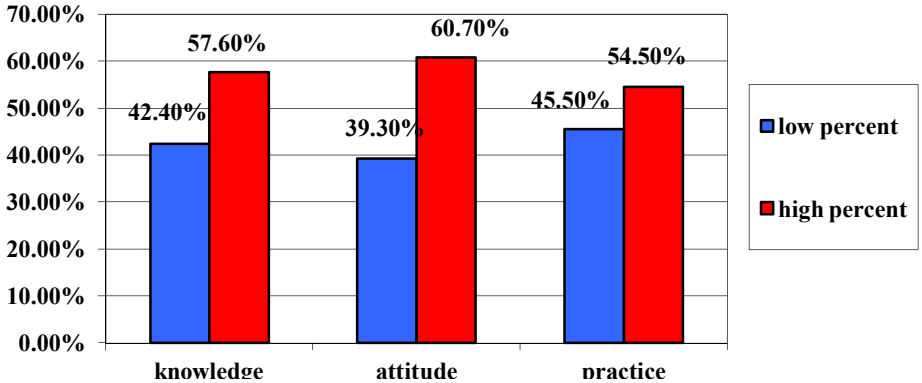

Figure (7) Bar chart showing percent of change of total score of knowledge, attitude and practice of personal hygiene among intervention group:

4. Discussion:

This study was carried out **(384)** primary school children in Sharkia governorate after dividing them into two group intervention (**191**) and control **(193)**. Semi structured questionnaire was used to compare pre intervention and post intervention questionnaire after intervention by health education program, **(50.0%)** of them were 11to12 years old, **(51.6%)** of them were female; about half of them were of moderate socioeconomic level and were from rural residence **(Table 1).** The current study agreed with a study carried out on Angola school children to assess personal hygiene practices by (***Vivas et al., 2010)*** in age group (mean age = 10.8 years old) but disagreed in distribution of sex, 49% of them were girls and 51% of them were boys. The current study agreed also with study carried out in preparatory schools in Ismailia city – Egypt by **Ismail *et al., 2011*** for Assessment of knowledge, attitude and practice of adolescents towards obesity in which 53.9% were females. The current study disagreed with ***(Oyibo, 2012)*** study in Nigeria about Basic personal hygiene among school children aged 6-14 years in which majority of the children (58.0 %) were in the age group 9-11 years, while 26.1 % and 15.9 % of them were in the age group 6-8 and 12-14 years respectively. Over half of the children were males (52.3 %). The current study also disagreed with study carried out in Fayoum (Upper Egypt) among school students about obesity by ***El Derwi1, et al., 2011*** in which boys represented 54.4% (N=544) of the sample, while girls constituted 45.6% (N=446) and Their age was more than 12.

There was no statistically significant improvement in knowledge, attitude and practice of healthy diet among control group **(Table 3)**. There was a statistically significant improvement in all items concerning knowledge, attitude and practice about healthy diet after application of health education sessions among intervention group (P< 0.001) (**Table 2).** These results reflect the effect of health education intervention. Percent of adequate Knowledge about Healthy diet and nutrition had been improved from **24.1% to 97.9%** after the intervention. Also, Percent of adequate Knowledge about Food pyramid had been markedly improved from **1.04% to 97.9%** after the intervention (**Table 2).** This finding was due to the effect of health education intervention beside high positive attitude towards Healthy diet in pre intervention. These results agreed with ***Kostanjevec, and Koch. (2011)*** study which was carried out among School children in Slovenia which showed statistically significant improvement in comparison to the examination of knowledge carried out before the course. These results also agreed with ***Thompson et al., 2013*** study carried out in USA among elementary-Age Children to examine the Impact of after School Health Education Program showed that there were statistically significant improvement of knowledge about health benefits of fruits and vegetables. Percent of positive attitude towards Component, Breakfast and Dairy product had been changed from **83.77%** to **97.9 %** after intervention. Percent of positive attitude towards Fruits and vegetables changed from **92.67%** to **98.43 %** post intervention. Percent of positive attitude towards Unhealthy diet showed minimal improvement from **70.68%** to **95.29 %** post intervention (**Table 2).** This improvement might be due to the effect of health education intervention. These finding was consistent to ***Kostanjevec et al., 2011*** study carried out among School children in Slovenia which showed statistically significant improvement in children's beliefs that regularly eating breakfast, lunch, and dinner as well as fruit and vegetables can influence their health. They strongly agreed with the statement that eating breakfast positively affects work at school. ***Kostanjevec et al., 2011 found*** also positive attitude to healthy dietary habits that encourages children to follow recommendations taken as healthy eating habits, while a negative attitude to unhealthy eating habits can prevent unhealthy forms of nutrition behavior. Percent of good practice of eating breakfast had been markedly changed from **21.99%** to **97. 9%** post intervention**.** Nevertheless, Percent of good practice of eating healthy diet showed minimal improvement from **82.19%** to **97.38 %** post intervention. Fortunately, Percent of eating unhealthy diet had been markedly decreased from **92.15%** to **9.95 %** post intervention (**Table 2).** This improvement in practice reflected the effect of health education intervention. Also, the high attitude in pre intervention stage might help in this improvement in practice. These results agreed with ***Sahar et al., 2011*** study in Egypt which was carried out among School Children Living in Slum Areas in Helwan Governorate which showed statistically significant improvement in eating habits after implementation of promoting life style program. Also, The results of current study was consistent with ***Céspedes et al., 2009*** study carried out in Spain among school children showed a significant increase in mean knowledge, attitudes, and habits scores at 36 months, compared with baseline: **87.94 vs. 76.15; 86.39 vs. 57.03; and 66.29 vs. 48.72** respectively all (***P* <.001**). **(Figure 1)** showed that the majority of the studied sample about (**74.0%)** did not eat breakfast. The main causes of not eating breakfast were no time (**39%**) then no desire (**31.0%) (Figure 2**). These finding might be attributed to that most students' parents were workers so there was no time for preparing breakfast and a lot of student depended on fast and junk food in school canteen. This finding

disagreed with ***Essien*** **et al., 2014** study which was carried out in Nigeria showed that **20.4%** reported meal skipping as habitual, while dislike for the meal accounted for 15% of the reason for meal skipping. The major meal skipped by the students was breakfast **(40.4%).** There was minimal improvement in percent of change of total practice score by **(50.80%),** followed by better improvement total attitude score by **(52.90%)** and lastly the higher improvement in total knowledge score by **(57.10%) (Figure 3).**

There was no statistically significant improvement in knowledge, attitude and practice of physical activity among control group **(Table 5).** There was a statistically significant improvement in all items concerning knowledge, attitude and practice about physical activity after application of health education sessions among intervention group (P< 0.001) **(Table 4).** This result reflected the effect of health education intervention. The present study showed that Percent of adequate Knowledge about Physical activity: definition, benefits and harms (being inactive) had been improved from **42.93% to 98.43%** after the intervention while Percent of adequate Knowledge about Physical activity practice had been markedly improved from**3.14 % to 98.43%** after the intervention. Also, Percent of adequate Knowledge about Physical activity pyramid was markedly improved from**1.57 % to 98.43%** after the intervention (**Table 4).** This improvement in adequate knowledge reflected the effect of health education intervention among interventional group. Percent of positive attitude towards Benefit of Physical activity was **89.01%** pre intervention and became **95.81 %** post intervention. Percent of positive attitude towards Physical inactivity was **68.06%** pre intervention and became **93.72 %** post intervention (**Table 4).** These results agreed with **Thompson et al., 2013** study carried out in USA showed that there were statistically significant improvement in attitudes and perceptions about physical activity. Percent of doing Physical activity and any sport had been changed from **29.84%** to **84.29 %** post intervention**.** Percent of Watching TV and playing on computer decreased from **90.58** to **33.51 %** post intervention (**Table 4).** This result reflected the effect of health education intervention. Beside the relatively accepted percent of positive attitude from the pre intervention stage which might be participate in this improvement. These finding agreed with **Anand, et al., 2014** study which carried out in Delhi and showed that a significant increase was noted in physical activity practice (**p < 0.001**) in an intervention group. The majority of the studied sample **(87.20%)** did not play any sport **(Figure 4).** These finding might be due to appearance of other playing like video games and mobile games which replaced the old games in which children were very active. The main type of sport played by studied sample was football **(61.20%) (Figure 5).** These finding might be attribute to that football was the most popular sport in Egypt beside the availability of a lot of playground for playing football. The current study showed that there was improvement of high percent of change of total score of attitude (**55.0%)** followed by improvement of total score of knowledge and practice which was (**50.80%)** of both about physical activity among intervention group **(Figure 6)**. These finding reflected the effect of health education intervention.

There was no statistically significant improvement in knowledge, attitude and practice of personal hygiene among control group **(Table 7)**. There was a statistically significant improvement in all items concerning knowledge; attitude and practice of personal hygiene (P< 0.000) among intervention group **(Table 6)**.These finding reflected the effect of health education intervention about personal hygiene. These results agreed with ***Haque et al. 2016*** a study to increase knowledge, attitude, and practices about oral hygiene among adolescents in Bangladesh which showed improvement in all items concerning knowledge; attitude and practice of oral hygiene (P< 0.001) after intervention. The present study showed statistically significant improvement after intervention as students adequate Knowledge increased from **13.61% to 97.91%** in Hand hygiene, from **10.47% to 91.10% in** Body and hair hygiene, from **6.28% to 84.29%** in Oral hygiene and lastly from **16.46% to 86.39%** in Knowledge about Types of personal hygiene (**Table 6).** These finding agreed with ***Haque et al. (2016)*** a study to increase knowledge, attitude, and practices about oral hygiene in Bangladesh showed improvement in knowledge from **19.3** %to **75.9 %** after the intervention. The present study showed statistically significant improvement after intervention as students positive attitude improved from **60.73%** to **93.72 %** towards Body and hair hygiene, from **74.87%** to **93.72 %** towards Hand hygiene and lastly from **85.34%** to **95.81%** towards importance of personal hygiene and oral hygiene (**Table 6).** Theses finding reflected the effect of health education intervention. These finding agreed with ***Haque et al. 2016*** a study in Bangladesh which showed improvement in attitude towards oral hygiene from **14.7 %to 57.8%** after the intervention The current study showed statistically significant improvement after intervention as students' good practice changed from **18.85%** to **95.29%** of oral, body and hair hygiene and **28.80%** to **95.81%** of Hand hygiene (**Table 6).** These improvements reflected the effect of health education intervention and might be also due to positive attitude in the pre intervention stage and the desire of student to be clean. These results agreed with ***Haque et al. 2016*** a

study in Bangladesh in which participants who received the intervention reported more frequent teeth cleaning (3 times or more per day) compared to baseline (**p < 0.001**). The results of the present study agreed with **Thompson et al., 2013** study in USA and ***Hildebrand* et al., 2012** which showed that there was statistically significant improvement in the behavior of washing hands before eating after the intervention. The current study showed that the high percent of change were **(60.70%),** (**57.60**%) and (**54.50**%) of total score of attitude, knowledge and practice respectively about personal hygiene among intervention group **(Figure 7).**

Conclusion and recommendations:

There was a lack of knowledge, relatively accepted attitude and poor practice about healthy diet, physical activity and personal hygiene among the studied sample. Health education intervention program among governmental primary school children (11-13 years old) was an effective method for raising their knowledge, improving their attitude and practice about healthy diet, physical activity and personal hygiene.

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Corresponding author:
Name: Lamiaa El Hawy
Address: Department of community medicine, environment and occupational medicine, Faculty of Medicine, Zagazig University, Egypt.
Email: kareemmohamed1013@yahoo.com.

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