Health Education Program Regarding Healthy Eating Habits and Physical Activity among Adolescents

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Abstract

Background: Eating habits formed during adolescence have been shown to track into adulthood; establishing healthy eating behaviors among adolescents, therefore, has both short- and long-term health benefits. Physical activity among adolescents promotes the development of motor skills, coordination, and balance, fostering a sense of confidence and self-esteem. Engaging in regular physical activity not only contributes to physical fitness but also has a profound impact on the mental, social, and emotional aspects of their lives. **Aim**: The aim of study was to evaluate the effect of health educational program on healthy eating habits and physical activity among adolescence at Ismailia City**. Design:** Quasi-experimental was utilized in this study. **Setting**: the study was conducted at four secondary school at Ismailia city. **Sample**: A convenience sample of 136 adolescent students. **Tools:** one tool were used to collect data Self-administered questionnaire sheet **Results**: revealed Statistically significant ($p < 0.001$mc) difference between studied student mean score of knowledge and practice regarding eating habit and physical activity among adolescence (pre /post) implementing of the program **Conclusion**: Statistically significant ($p < 0.001$mc) difference between studied adolescent mean score of knowledge and practice regarding eating habit and physical activity among adolescence, while the health education program intervention program effective in improving knowledge and practice among studied adolescent after implementing the program. **Recommendations**: Develop health educational program among school student in different educational level regarding knowledge and practices related eating habit and physical activity.

Key words: Adolescents, knowledge, practice, Physical Activity.

1. Introduction

Healthy eating affects adolescents specifically in that it has an impact on adolescents whose bodies and minds are still growing **(Shaluhiyah, Indraswari, & Kusumawati, 2021).** Intermediate and secondary school age is an important stage, as adolescents often develop their own ideas about health in this phase. Adolescents specifically must focus on healthy eating because they are in a phase of growth and change, and adolescents need more calories and nutrients than any other age group to support their developing bodies **(American Academy of Pediatrics, 2019).**

Additionally, students need more food during school hours because of the added demands on their energy; a great deal of research has found that healthy eating starts in school. There are some issues that affect school behavior, such as eating habits and physical activities; students must be healthy in order to take full advantage of their education **(Hadi et al ., 2022).**

Approximately 80% of adolescents globally do not reach recommended levels of physical activity, which fuels the rise in obesity and associated health problems. The World Health Organization (WHO) reports that just 20% of adolescents eat the recommended five servings of fruits and vegetables each day, while nearly 45% of them regularly eat fast food **(WHO, 2022).**

Adolescent physical, mental, and social growth depends on physical activity. Regular exercise aids in the fight against the increased prevalence of obesity and related health problems among youth. Sports, dancing, and even walking to school are examples of activities that not only increase cardiovascular fitness but also improve mental health outcomes by lowering symptoms of anxiety and depression. The World Health Organization (WHO) recommends that adolescents between the ages of 11 and 17 participate in at least 60 minutes of moderate to vigorous physical activity each day. Engaging in physical activities promotes social interactions and collaboration, both of which are essential for personal growth during these critical years **(WHO, 2020).**

Community Health Nurses actively engage with the community to raise awareness about

the importance of healthy eating and physical activity. They collaborate with schools, community centers, and other organizations to develop health promotion programs, workshops, and events targeting adolescents. They may organize sports activities, cooking demonstrations, and educational sessions to encourage healthy behaviors **(Diniz et al , 2020) .**

Significance of the Study:

Healthy eating practice and physical activity promotes good health, growth and intellectual development in addition to prevention of diseases. A good interventional stage in the life cycle is adolescence because it gives a chance to acquire knowledge and practice, they are crucial to understanding the reasons for unhealthy eating among adolescents, because adolescents develop personal eating habits based on their dietary knowledge and practice **(Van Sluijs et al., 2021).** So, that study was carried out to assess the effect of a health education program on adolescent knowledge and practices regarding physical activity.

The Aim of the study:

The aim of the study was to assess the effect of a health educational program on healthy eating habits and physical activity among adolescents in Ismailia City.

Research hypothesis:

H0: Health education programs do not improve knowledge and practice regarding eating habits and physical activity among adolescents**.**

H1: Statistical significance will improve knowledge and practice regarding eating habits and physical activity among adolescents after program implementation

2. Subject and Method

Research design:

Quasi-experimental research design was conducted in this study.

Setting of the study:

The study was conducted at four secondary school at Ismailia city (North Ismailia administration), four secondary school were selected randomly from the total number of schools in North Ismailia administration (9).

Sampling size:

The sample of the study: A convenience sample was used in this study.

Inclusion criteria:

All students aged between 14–18 year-old in school settings

Both genders male and female

Exclusion Criteria:

1. Students with high rate of absenteeism.
2. Inclusive Students.

Tools of data collection:

Tool I: *The self-administered questionnaire was modified and translated into Arabic by the researcher after review of the literature based on* ***Turconi, Celsa et al. (2003)*** *and* ***Wilson, Magarey et al. (2013).*** *It consisted of two parts:*

Part 1: Socio-demographic data of students, such as age, gender, parent education, etc.

Part 2: It included 4 section questions about knowledge and practice, physical activity, and eating habits.

Section (1): Nutrition Knowledge: It was containing eleven questions

Scoring system:

The student questionnaire sheet for assessment knowledge regarding healthy eating habits based on **(Bhuiyan et al ., 2021) .**

The result categorized as the following:

(2) Scores were given for complete correct answer

(1) Score for incomplete correct answer

(0) for don't know and incorrect answer

The total score was calculated by summing up and converted in to a percent score. Student total level of knowledge has been classified as follows:

< 50%Low level of knowledge

50 - 75 % Moderate level of knowledge

> 75 %High level of knowledge.

Section (2): School food: It was containing seven questions.

Scoring systems:

-School food the response categories were four and the true response of each question received a score of 1 and 0 for the other response.

The total score was calculated by summing up and converted in to a percent score. Student total level of practices has been classified as follows:

< 50% Poor practices

50 - 75 % Moderate practices

> 75 % Good practices

Section (3): knowledge regarding physical activity at school: It was containing six questions.

Scoring systems:

The student questionnaire sheet for assessment knowledge regarding Physical activity, the scoring system based on **(Moreno-Lavaho, et al 2021) .**

The result categorized as the following:

(2) Scores were given for complete correct answer, (1) score for incomplete correct answer, (0) for don't know and incorrect answer

The total score was calculated by summing up and converted in to a percent score. Student total level of knowledge has been classified as follows:

-< 50 %poor knowledge

- 50 - 75 % sufficient knowledge

-> 75 %good knowledge.

Section (4): Reported practice of physical **activity at school: It was containing seven questions.**

Scoring systems:

Reported practice of physical activity at school: The result categorized as the following: (2) scores were given for complete correct answer, (1) score for incomplete correct answer (0) for don't participate in any activity. the total scores of 14 grade .

- 50% poor practice

- < 50 % good practice

Validity of tools:

A panel of three experts in family and community health nursing was reviewing the tools who revised the tools for clarity, relevance, applicability.

Reliability of tools:

Tools reliability were assessed by the researcher for testing internal reliability of the tool, the questionnaire value was (0.840) C A.

Ethical considerations:

The study was reviewed by the Research Ethics Committee (REC) number (150) in the Faculty of Nursing, Suez Canal University. A written approval was obtained from the managers of schools taken after explained the aim and nature of the study. Also, the aim was explained to the students who participant in

the study to be familiar with the importance of participation, also they were assured that the information would renowned confidentiality and was used for the research purpose only, and they have the right to refuse participation and withdrawal from the study at any time.

Pilot study:

It was carried out on 10 % of student 14 student were selected randomly from four school**.**

Fieldwork:

A. Approvals:

An official letters were issued from the Faculty of Nursing, Suez Canal University to the information security office in Central Agency for public mobilization & Statistics (CAPMAS) , to get an approval for data collection to conducted the study , that forwarded to the directorate of education and the Ismailia educational administration to obtain permission for collecting the necessary data from the selected schools .

A written approval was obtained from the managers of the selected schools based on the approval of directorate of education in Ismailia.

Before starting the data collection, the agreements were obtained and the aim of the study explained to the schools managers to gain their cooperation during data collection.

B. Data collection:

Data were collected from beginning of October 2023 to end of April 2024 , the actual duration was three months & a halt , " the period of examination and holidays were excluded

C. **Implementation phase**

This was implemented through four phases as namely:

- Assessment phase
- Planning phase
- Implementation phase
- Evaluation phase

Assessment phase: (pretest)

Assessment phase (Pre-test): Beginning in October 2023, baseline data on knowledge and practices were collected from 136 first-grade secondary students over four weeks, with 80-minute sessions per school. Questionnaires took approximately 30 minutes to complete, and BMI measurements about 40 minutes per group.

The assessment phase was beginning at the second week of October (pre - test) was done on 136 students from the first secondary grades students because, the other grade student that were high rate of absenteeism so that excluded from the

sample. Every school taken one week, the four schools taken four weeks to be fulfilled, four visits for each school weekly, including four sessions, each session taken 80 minutes were allocated for data collection, nearly 34 students were assessed per visits The pre - test format to assess the baseline data for students ' knowledge and practices, and to detecting the needs through collecting data from them. The aim of the study was explained to the students and distribute the questionnaire to them, the average time needed to fill the questionnaire was 30 minutes by the student, each group 10 minute break every session.

II-Planning phase:

The program was designed by the researcher based on the students ' needs obtained from the study tool; also, after reviewing the relevant literature in various aspects related to the study.

III- Implementing phase:

The implementation phase was beginning in November 2023 to the end of march 2024 was taken 29 sessions each session was taking 80 minutes for each school and 10-minute break between sessions 4 days per week to complete the implementation phase to all schools .The implementation phase 3 months excluded vacations and exam period **.**

Evaluation phase:

This phase aimed to evaluate the level of improvement in knowledge and practices among adolescent students about healthy eating habits and physical activity. The evaluation phase (post - test) it was done through from the beginning **of April 2024** after approximately three months from the program beginning.

Statistical Analysis:

All Data were collected, tabulated and subjected to statistical analysis. Statistical analysis was performed by SPSS in general (version25), also Microsoft office Excel was used for data handling and graphical presentation. Quantitative variables were described by the mean; SD. qualitative categorical variables are described by proportions and Percentages. Paired sample t test, McNamara a test, Test (Friedman) was used for comparing pre and post quantitative scales, Independent sample test is used for comparing two groups. For qualitative categorical variables chi - squared test is applied. One-way Anova test, Friedman was use.

3. Results

Table (1): Shows the mean age of the studied adolescent 15.73± and 55.1% of them female, regarding parent's education level, 55.9 % of fathers have university degree, 53.7of mothers university degree, 78.7% of their fathers were an employed, 50.7 % of mothers were housewives.

Table (2): Show that there was statistically significant (p<0.001*) difference between the studied adolescent knowledge regarding nutrition (pre /post)intervention program.

Figure (1): Demonstrate that the total mean score nutritional knowledge was improved among studied adolescent after implementation the program .

Table (3): Show that there was statistically significant (p<0.001*)difference between the studied adolescent school food post intervention compared to the pre-intervention about adolescent behaviors and experiences with food choices and school purchases, purchasing from street vendors outside school, purchasing from school canteen, having sweetened beverages per day and having biscuits, cake, chocolate, candy, chips, and fries during snacks, school breaks practice post intervention compared to the pre-intervention .

Table (4) : Show that there was statistically significant (p<0.001*) difference between the studied adolescent post intervention compared to the pre-intervention regarding knowledge about physical activity at school about time that should be adolescents spend in physical activity at school each day, barrier to physical activity during the school day, recommended frequency of physical education classes for adolescents at school ,a key factor in determining the physical activity levels of adolescents at school, schools support adolescents in meeting their physical activity needs and type of physical activity is recommended for adolescents during the school day.

Figure (2): Show that the total means score of knowledge regarding physical activity at school was improved among studied adolescent after implementation the program as they were reported.

Table (5) : Show that there was statistically significant (p<0.001*) difference between the studied adolescent post intervention compared to the pre-intervention regarding reported practice of physical activity at school about a common type of physical activity practiced at schools, type of aerobic activities should practice at physical

education class, type of bone-strengthening activity practice at physical education class ,type of physical activity class typically involves activities like stretching, balance, and controlled movements, team sports was played in school physical education classes, how did the studied adolescent get to school every day and how much the studied adolescent like physical education classes at school**.**

Figure (3): Show that the total means score of the reported practice regarding physical activity at school was improved among studied adolescent after implementation the program as they were reported.

4. Discussion

A statistically significant ($p<0.001$*) difference between the studied adolescent knowledge regarding nutrition (pre /post)intervention program this align with **(Kyomuhangi, Tamare, & Collins , 2022)** indicating improved nutritional knowledge after educational interventions. Also Similarly with study done by (**Shapu, Ismail, Ahmad, Lim, &Njodi , 2020)** in Malaysia who reported that interventions that include health education improve eating behavior.

Further support comes from **(Vanessa et al. 2022).** Who Found the overall knowledge about nutrition among adolescents significantly improved post-intervention. Similar findings were reported by (**Patimah, Idrus, & Noviasty, 2023).** showed that after intervention the program was a notable increase in the mean value of nutrition-health knowledge in both groups and increase was significantly higher in the intervention group.

Also supported by **(Kendel Jovanović, Janković, & Pavičić Žeželj, 2023)** in town of Rijeka, Croatia , Who studied " The effect of nutritional and lifestyle education intervention program on nutrition knowledge, diet quality, lifestyle, and nutritional status of Croatian school children". Who found a significant increase in nutrition knowledge among student post intervention. From my opinion the enhancing knowledge about nutrition is essential for fostering a generation that is more informed about their health and capable of making healthier lifestyle choices and the positive shift in knowledge can inform future interventions.

Post-program implementation, the total score of nutritional knowledge significantly

improved This finding aligns with **Charles Shapu, Ismail, Ahmad, , Lim, & Abubakar, (2020) .** who found that increasing score of nutritional knowledge among adolescent's post intervention .

Similar findings were reported by **(Brown et al ., 2021)** in. who found that adolescents who used food, nutrition, or health applications scored higher on food, nutrition, and total knowledge than students who did not use these applications.Also supported by **(Jan , 2024).** who found the mean nutritional knowledge scores of the adolescent girls significantly increased from 4.93 to 9.18 after the intervention. In the same line with **(Raikar et al., 2020)** who found there was a significant increase (mean difference score was1.7890±0.1434) in the nutrition‐related knowledge of the participants after the intervention ($P < 0.001$). Further support comes from (**Wadolowska, et al ., 2021)** Who found a significant increase in the nutrition knowledge score was noted in the educated group on average by 2.4 and 2.2 points after three and nine months, respectively. From my opinion the increase in nutritional knowledge scores indicates that the program was effective in delivering relevant information and engaging the studied adolescent.

Adolescents' knowledge concerning physical activity at school improved significantly post-program implementation. This result is in agreement with**(Christodoulakis et al., 2024).** Who observed interventions have a positive effect on physical activity and its various aspects in adolescent students in school and knowledge regarding physical activity among adolescent at school was improved after intervention program.

In the same direction with **(Oddo et al , 2022)** who found that overall knowledge was significantly higher post-intervention regarding a knowledge assessment on nutrition, as well as indicators of attitudes and physical activity . From the researcher point of view that the educational settings play critical role in promoting knowledge and healthy habit. Schools are pivotal atmospheres for instilling knowledge and habits that can influence students' lifestyle choices both now and in the future.

Concerning with the total mean score of knowledge regarding physical activity at school was improved among studied adolescent after implementation the program as they were reported. This result approve with (**Grady et al., 2023)** Who reported that

there was a total mean score of Knowledge was improvement among adolescents regarding physical activity knowledge at school.

The present study show that there was statistically significant ($p<0.001$*) difference between the studied adolescent post intervention compared to the pre-intervention regarding reported practice of physical activity at school this result supported by **(Demetriou, & Bachner, 2019)** who reported that the increase of physical activity levels in girls at secondary schools and offer insights into the mechanisms of physical activity behavior change post intervention. Also supported by **(Neil-Sztramko, Caldwell, & Dobbins, 2021)** who found that school-based physical activity interventions improve physical fitness post intervention.

This result disagrees with **(Toftager et al., 2014)** who found no significant difference was found for overall physical activity with an adjusted for school time activity. Also in contrast (**Habib-Mourad , et al., 2020)** who found students' physical activity level did not change or improve post intervention, which may be explained by external factors such as limited accessibility to extra-curricular activities.

From the researcher point of view that the intervention program empowered students to take charge of their physical health. By providing information and opportunities for practice, adolescents may feel more confident in their ability to engage in regular physical activities, which is crucial for fostering lifelong healthy habits.

Reported practice regarding physical activity at school also demonstrated a statistically significant improvement in the total mean score among studied adolescent after implementation the program as they were reported this result with the same line with **(Rizvi, Kumar , Kulkarni, & Kamath, 2022).** who reported that the mean physical activity practice score in the intervention group improved significantly from 16.19 ± 4.61 to 19.46 ± 10.07 ($p < 0.001$). From the researcher point of view that the significant increase in mean score of reported physical activity practices indicates a critical step toward establishing a culture of physical activity, which can influence peers and create a supportive environment for ongoing engagement in fitness activities.

5. Conclusion:

Based on the findings and research hypothesis of the current study, it was concluded that:

Statistically significant ($p < 0.001$mc) difference between studied adolescent mean score of knowledge and practice regarding physical activity among adolescence at school , while the health education program intervention program effective in improving knowledge and practice among studied adolescent after implementing the program.

6. Recommendations:

Based on the present study finding, the following recommendations can be classified

- Implement physical education program in school that offer a variety of activity and sports.
- Increase knowledge and practice regarding healthy eating habits, physical activity among student through social media

Acknowledgments:

Author Firstly, I address my deepest thanks and gratitude to Allah who bestowed upon me the power to accomplish this reserch. Words are never enough to express my thank gratitude to wards all students who participated in the study, I express my deep sense of gratitude to all who have contributed for the successful completion of this study. My heartfelt thanks to all supervisors for this research for their efforts and hard work to make the research appear in this form

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Table (1): **Socio- demographic characteristics of the Studied adolescent**(n=136).

Items	**N**	**%**
Age (Years)		
Mean ±SD	15.73±.42	
Gender		
Male	61	44.9
Female	75	55.1
Father education		
Basic education	6	4.4
Secondary	46	33.8
College /University	76	55.9
Post graduate	8	5.9
Father Occupation		
Farmer	10	7.4
Self-Employed	13	9.6
Employee	**107**	**78.6**
Died	6	4.4
Mother education		
Basic education	12	8.8
Secondary	44	32.4
College/University	**73**	**53.7**
Post graduate	**7**	**5.1**
Mother Occupation		
Farmer	12	8.8
Self-Employed	4	2.9
Housewife	**69**	**50.8**
Employee	47	34.6
Died	4	2.9

Table (2): Statistical difference between studied adolescent knowledge regarding nutrition (pre/post) (n=136)

Items	Correct answer				McNemar test (Pvalue)
	Pre		Post		
	N.	%	N.	%	
1. The different foods that contain carbohydrates is	54	39.7	105	77.2	<0.001*
2. The different foods that do not contain dietary fiber is	26	19.1	107	78.7	<0.001*
3. The different foods that are less rich in fat is	27	19.9	109	80.1	<0.001*
4. The different foods that are richer in protein is	25	18.4	120	88.2	<0.001*
5. The different foods are richer in calories is	29	21.3	111	81.6	<0.001*
6. The different substances contain more energy is	21	15.4	111	81.6	<0.001*
7. Functions of vitamins and minerals is	40	29.4	101	74.3	<0.001*
8. A Balanced diet is	12	8.8	103	75.7	<0.001*
9. Daily energy expenditure is	21	15.4	117	86.0	<0.001*
10. Biological foods are	15	11.0	108	79.4	<0.001*
11. Transgenic foods are	47	34.6	110	80.9	<0.001*
Total level of knowledge pre	***Low: 81.6%** ***Moderate :10.3 %** ***High :8.1**				
Total level of knowledge post	***Low: 5.1 %** ***Moderate :19.2 %** ***High :75.7%**				

P value was significant <.05

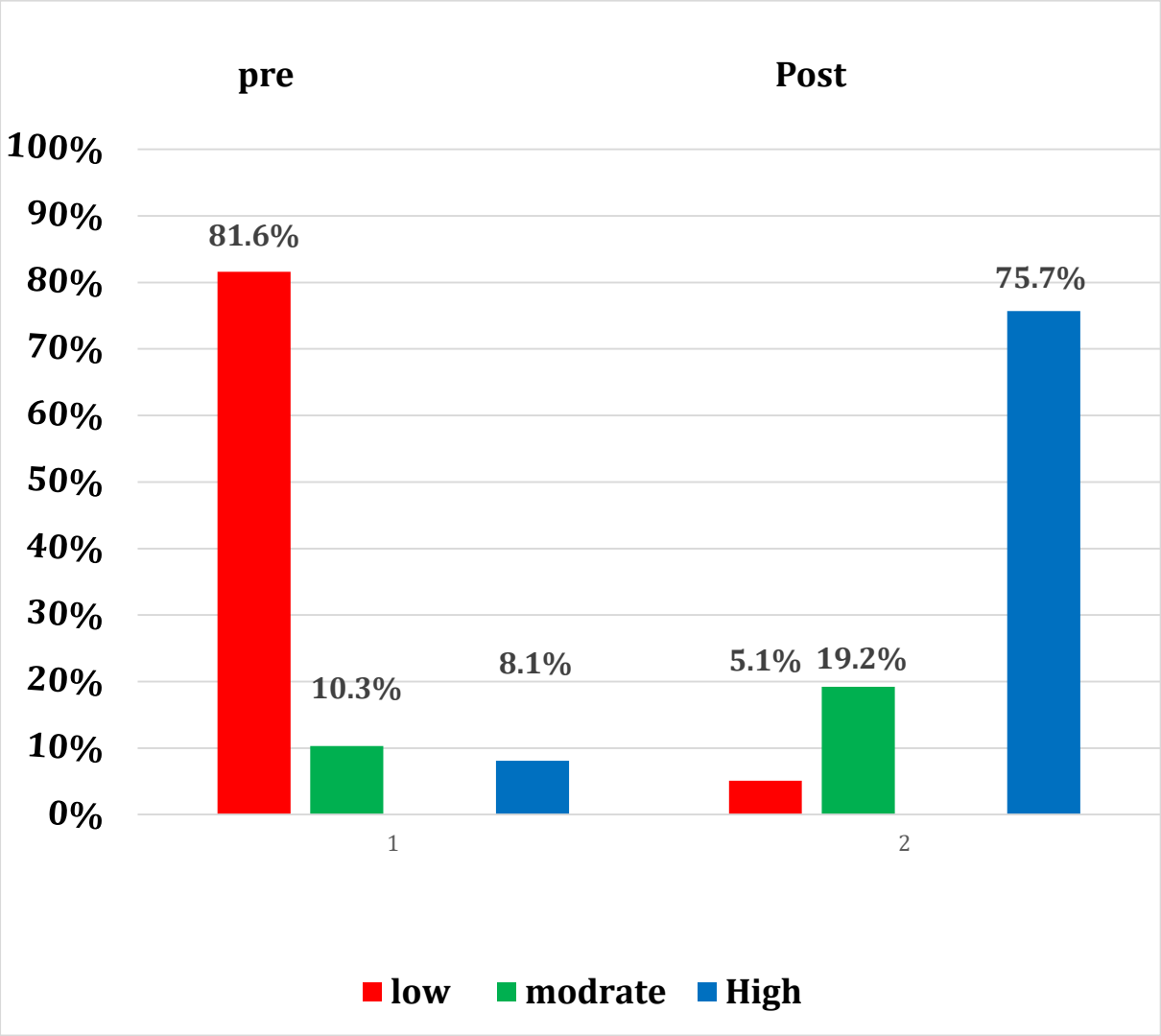

Figure (1): Total mean score of the studied adolescent regarding nutritional knowledge (n=136).

Table (3): Statistical difference between studied adolescent regarding school food practice pre /post (n=136).

Items	Pre		Post		Test (Friedman)	(P value)
	N.	%	N.	%		
1.The food you eat at school is usually brought from						
Brought from home	42	30.9	107	78.7	X^2 88.00	**<0.001***
Bought at the school canteen	33	24.3	17	12.5		
Bought elsewhere (e.g., supermarket)	52	38.2	9	6.6		
Combination of above sources	9	6.6	3	2.2		
2. The number of times per week you buy food or drinks from street vendors outside school is						
Never	24	17.6	106	78	X^2 98.00	**<0.001***
Once per week or less	13	9.6	7	5.6		
Twice per week	37	27.2	9	6.7		
Three to Four times per week or more	62	45.6	14	10.3		
3. The number of times per week do you buy food or drinks from outside the school area (e.g., supermarket and bakery) is						
Never	15	11	57	41.9	X^2 103.47	**<0.001***
Once per week or less	25	18.4	45	33.1		
Twice per week	37	27.2	16	11.8		
Three to Four times per week or more	59	43.4	18	13.2		
4. The number of times per week you buy food or drinks from your school canteen is						
Never	21	15.4	49	36	X^2 94.00	**<0.001***
Once per week or less	17	12.5	52	38.2		
Twice per week	27	19.9	14	10.3		
Three to Four times per week or more	71	52.2	21	15.5		
5. The number of times you having a glasses of sugar sweetened beverages per day at school is						
Never	20	14.7	74	54.4	X^2 108.0	**<0.001***
One per day	14	10.3	44	32.4		
Two per day	60	44.1	10	7.4		
Three per day or more	42	30.9	8	5.8		
6. The number of times you eat snacks per day (e.g., biscuits, cake, chocolate, candy, chips, and fries)						
Never or less than 1 per day	21	15.4	54	39.7	X^2 98.00	**<0.001***
One per day	26	19.1	51	37.5		
Two per day	45	33.1	14	10.3		
Three per day or more	44	32.4	17	12.5		
7. During the school breaks I usually do						
Chat with other students	29	21.3	18	13.2	X^2 8.39	**<0.004***
Eat my sandwiches or snacks	45	33.1	60	44.1		
play with friends	22	16.2	44	32.4		
Check social media	40	29.4	14	10.3		

X^2 was chi-square test, ^{MC} is montecarlo chi-square test; P value was significant <.05

Table (4): Statistical difference between studied adolescent knowledge regarding physical activity at school pre /post (n=136)

Items	Pre		Post		Test	P value
	N.	%	N.	%	(Friedman)	
1. The time should adolescents spend in physical activity at school each day is						
0 to 10 minutes	30	22.1	9	6.6	X^2 32.2	**<0.001 * mc**
30 minutes	50	36.8	5	3.7		
60 minutes	27	19.8	116	85.3		
90 minutes	29	21.3	6	4.4		
2. The barriers for physical activity during the school day is						
Lack of facilities	77	56.6	7	5.1	X^2 106.0	**<0.001 * mc**
Lack of time in the schedule	18	13.2	2	1.5		
Lack of safe spaces for activity	12	9	3	2.2		
Lack of teacher training on activity integration	7	5.1	2	1.5		
All of the above	22	16.2	122	89.7		
3. The recommended frequency of physical education classes for adolescents at school is						
1 day per week	70	51.5	13	9.6	X^2 28.25	**<0.001* mc**
2 days per week	27	19.9	9	6.6		
3 days per week	22	16.1	7	5.1		
Daily	17	12.5	107	78.7		
4. Factors that determining the physical activity levels of adolescents at school						
Socioeconomic status	74	54.4	12	8.9	X^2 50.00	**<0.001 * mc**
Family support	30	22.1	17	12.5		
School environment	29	21.3	5	3.6		
All of the above	3	2.2	102	75.0		
5. Schools support adolescents in meeting their physical activity needs by						
Providing after-school sports programs	42	30.9	**3**	**2.2**	X^2 88.00	**<0.001* mc**
Extracurricular sports teams	33	24.3	17	12.5		
Educating students on the importance of physical activity	52	38.2	9	6.6		
All of the above	9	6.6	107	78.7		
6. Types of physical activity is recommended for adolescents during the school day are						
Aerobic exercise like brisk walking or jogging	75	55.1	17	12.5	X^2 10.71 **(.001*) mc**	**<0.001 * mc**
Muscle-strengthening exercises like push-ups or squats	40	29.4	9	6.6		
Flexibility exercises like stretching	5	3.7	8	5.9		
All of the above	16	11.8	102	75.0		

X^2 was chi-square test, ^{MC} is montecarlo chi-square test; P value was significant <.05

Figure (2):

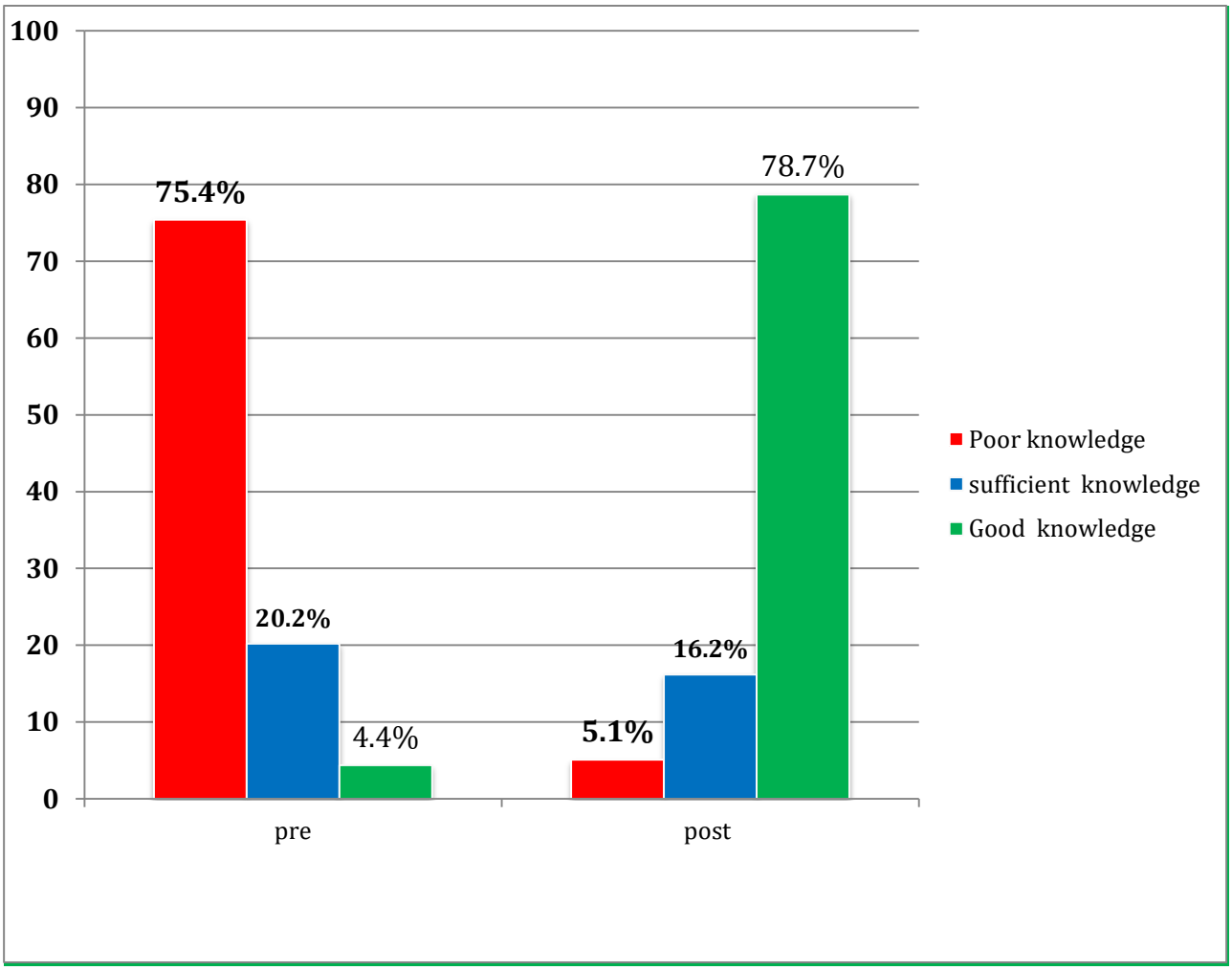

Figure (2): Total means score of studied adolescent knowledge regarding physical activity at school (n=136).

Table (5): Statistical difference between studied adolescent regarding reported practice of physical activity at school pre /post (n=136)

Items	Pre		Post		Test (Friedman)	p-value
	N.	%	N.	%		
1. A Common type of physical activity you practice at schools is						
Foot ball	22	16.1	60	44.1	X^2 18.33	**<0.001 *mc**
Tennis	13	9.6	15	11.0		
Running	21	15.5	24	17.7		
Basketball	24	17.7	25	18.3		
I don't participate in any activity	56	41.1	12	8.9		
+Others	0	0	0	0		
2. Types of aerobic activities should practice at physical education class are						
running	70	51.5	13	9.6	X^2 28.25	**<0.001 * mc**
jumping	27	19.9	9	6.6		
walking	22	16.1	7	5.1		
All of the above	17	12.5	107	78.7		
3. Types of bone-strengthening activity practice at physical education class are						
Run (for more than 10 minutes at a time)	40	29.4	77	56.6	X^2 83.00	**<0.001 * mc**
Practice martial arts, wrestling, boxing, kick boxing	22	16.1	23	17		
Play other active games like capture the flag, tag, jump rope, Ride a bicycle.	20	14.8	22	16.2		
I don't participate in any activity	54	39.7	14	10.2		
4. Team sports is often played in school physical education classes are						
Handball	18	13.2	22	16.2	$X^2$106	**<0.001* mc**
Foot ball	22	16.2	54	39.8		
Basket ball	29	21.3	31	22.8		
Tennis	15	11.1	16	11.7		
I don't participate in any activity	52	38.2	13	9.5		
5. Types of physical activity like stretching, balance, and controlled movement						
touching your toes, doing side stretches	26	19.1	50	36.7	X^2 81.31	**<0.001* mc**
standing on one foot, then repeating with the other	43	31.6	54	39.7		
Standing knee lift, or arm	23	16.9	32	23.6		
I don't participate in any activity	44	32.4	0	0		
6. You go to school every day by						
I walked	52	38.2	106	78	X^2 43.61	**<0.001* mc**
I rode a bike, skateboard, skates, or scooter (not motorized)	35	25.7	14	10.3		
I rode in a car	23	16.9	9	6.6		
I rode the bus	26	19.1	7	5.1		
Other	0	0	0	0		
7. You like physical education classes at school						
I like PE a lot	77	56.6	107	78.7	X^2 10.71	**<0.001 * mc**
I like PE a little bit	38	28	26	19.1		
I don't like PE very much	12	8.8	3	2.2		
I don't like PE at all	9	6.6	0	0		

Figure (3):

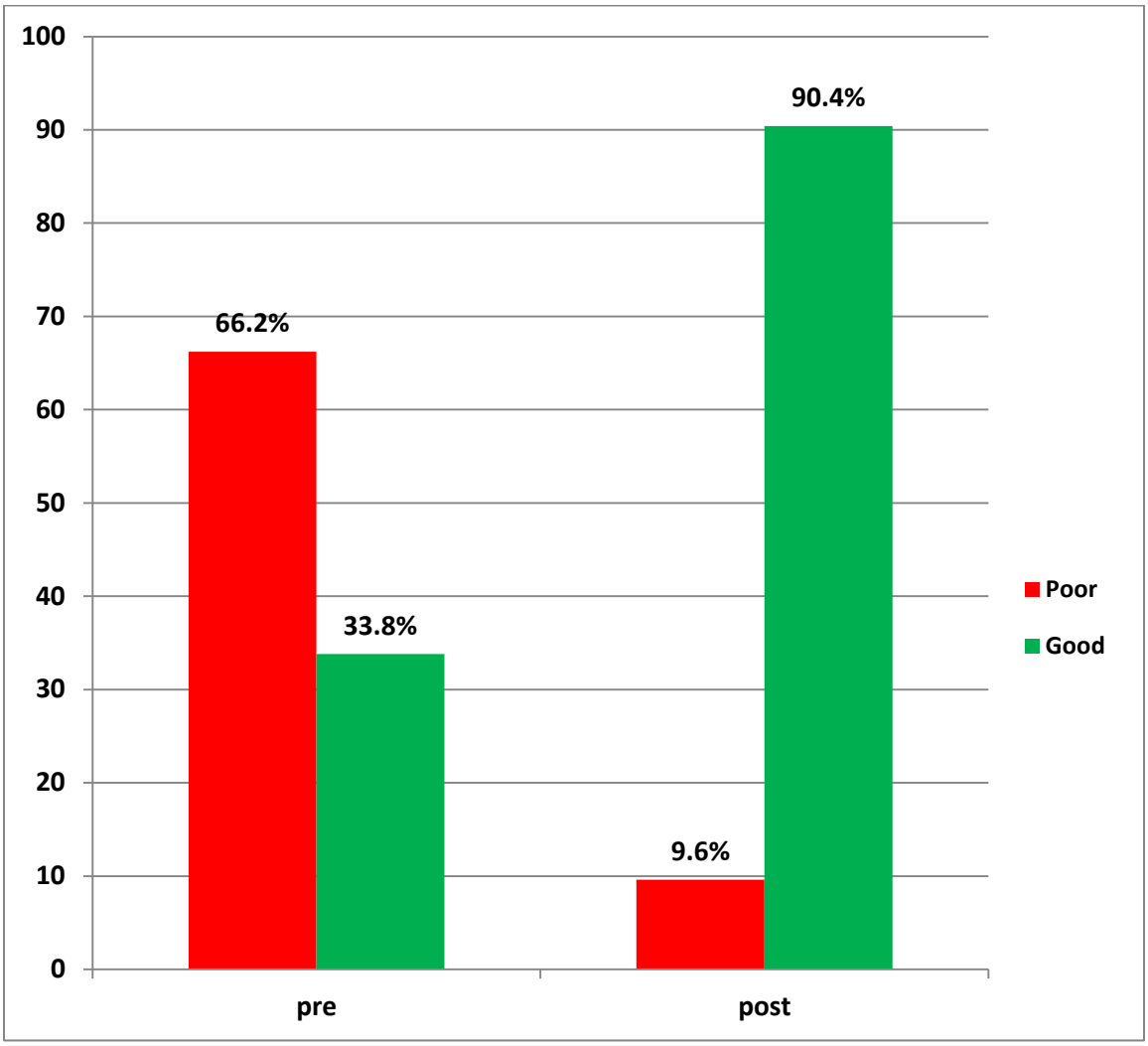

Figure (3): Total means score of studied adolescent reported practice regarding physical activity at school (n=136).

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