

## Assessment for School Students' Perception regarding Healthy Nutritional Pattern

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### Abstract

**Background:** Healthy nutrition is a cornerstone for the school students' health and wellbeing. Unhealthy nutritional behaviors are core contributors to chronic diseases and health problems. **The aim** of this study was to assess school students' perception regarding the healthy nutritional pattern. **Research design:** A descriptive exploratory design was utilized. **Setting:** This study was conducted at Kastal and El Ewina School, Awlad abd Alla School, Tenida School and Balat School. **Sample:** A convenient sample composed of 300 students, who attend the previously mentioned settings. **Tools of data collection:** the study tools were; 1) Predesigned Questionnaire Format which included three parts: To assess demographic characteristics of the studied student, to assess the school environment and to assess students' knowledge regarding healthy nutrition, 2) Assessment sheet for the students' nutritional practice: included two parts: to assess students' reported practice regarding healthy nutritional pattern and assessment for the students' nutritional pattern, 3) Assessment for the students' health status, included Physical examination sheet to assessment of all body parts to detected signs of nutritional deficiencies, Students' anthropometric measurements, and Mid-Upper Arm Circumference (MUAC). **Results:** The most of studied students had satisfactory total knowledge about food sources rich in protein and satisfactory total knowledge about the importance of healthy nutrition and the majority of them had satisfactory total knowledge about food sources rich in carbohydrates. Two thirds of them had satisfactory total knowledge about food sources rich in vitamins and minerals. Also, the majority of the studied students had good nutritional practices. There was statistically significant weak positive correlation between the studied students' knowledge and their reported practice regarding proper nutrition ( $r=.097$ ,  $p=.04$ ) and there was statistically significant very weak positive correlation ( $r=.006$ ,  $P=.015$ ) between reported practice and weight. Also, there was statistically significant very weak positive correlation ( $r=.042$ ,  $P=.04$ ) between reported practice and BMI. **Conclusion:** There was statistically significant weak positive correlation between the studied students total's knowledge and their total reported practice regarding proper nutrition ( $r=.097$ ,  $p=.04$ ) **Recommendation:** Provide school based nutritional programs for the students, aiming to improve nutritional pattern through health educational instructions, Involve teachers, school personnel, parents, communities, and local government in the development and implementation of school nutrition programs and Integration of nutrition education into the school curriculum for all age groups.

**Key Words:** School Students' -Nutritional Pattern.

### Introduction

Healthy nutrition is a cornerstone for students' health and wellbeing. Unhealthy nutritional behaviors are core contributors

to chronic diseases and health problems. It helps protect against malnutrition. However, there are two major types of nutritional problems including; inadequate intake of some essential nutrients, and an excessive intake of food or certain type of nutrients.

Thus, without proper healthy nutrition, health might be unattainable (*Rippe, 2018*).

Healthy nutritional pattern is the quantities, proportions and variety or combination of different foods, drinks and nutrients in diets, and the frequency which they are habitually consumed. It includes eating breakfast every day while avoiding overnight eating, choosing a diet of moderate in sugars and salts, avoiding large amounts of sweet, soft drinks, fruit flavored colored, chips and candy, practicing proper hygiene measures, eating in sitting position, avoiding eating during watch the television and practicing daily sports (*Sackset al., 2017*).

School age is the active growing phase of childhood, it represents a dynamic period of physical growth as well as mental development of the child. School age students are the most vulnerable to malnutrition due to their high nutritional requirements for growth and development (*Larson et al., 2018*).

Schools provide a highly effective and efficient environmental setting for establishing nutritional healthy behaviors. Also, it is considered the ideal setting to improve eating behavior, health and nutritional knowledge and boost the ability of students to make informed choices (*Hermans et al., 2018*).

Nutritional health problems in school age students are the most common causes of low school enrolment, high absenteeism, early dropout and unsatisfactory classroom performance (*Stormark et al., 2019*).

The nurse plays an important role in assessing the nutritional pattern for students and in seeking additional evaluation from dietitians and nutritionists in complex situations. The ability to assess a student's

nutritional status using anthropometry measurements. Additional measurement may include chest circumference and mid arm circumference. Also, student's observation and history are vital. Therefore, it is important for the nurse to have an understanding of the implications of information gained during nutritional assessment of the student in schools (*Williams et al., 2020*).

### **Significance of the study**

Students' perception regarding healthy nutritional pattern is essential for proper growth and physical development to ensure optimal work capacity, normal reproductive performance, adequate immune reactions and resistance to infections. It determines their understanding of proper nutritional needs and methods of satisfying those needs.

In Egypt, malnutrition disorders affect more than 30% of school students classified as: stunting is 21.40% wasted is 8.40% overweight is 14.90% and obese is 5.80%. This problem appears to be largely attributable to poor dietary quality and micronutrient deficiencies, including iron and vitamin A deficiencies (*Metwally et al., 2020*).

Therefore, it is important to assess the school age student's perception regarding healthy nutritional pattern

### **Aim of the Study**

The current study aimed to assess school students' perception regarding the healthy nutritional pattern through assessing:

- Assessing school students' knowledge regarding healthy nutritional pattern.

- Assessing school students' reported practices regarding healthy nutritional pattern.

### Research Questions

- 1) What is the perception of school students regarding healthy nutritional pattern?
- 2) Is there a relation between the perception of school students and their characteristics?

### Subjects and Method

#### Research design:

Descriptive study was used to assess school students' perception regarding the healthy nutritional pattern.

#### Research setting:

This study was conducted in the New Valley governorate. The investigators selected randomly four primary schools from a list of schools in the pre mentioned city which are (kastal and Elewina School, Awlad AbdAlla School, Tenida School, and Balat School).

#### Sampling:

The study was carried out three days (Sunday-Monday-Tuesday) per week during morning shift over six months period (each school took approximately 6 weeks for completing data collection) from November 2018 to April 2019 using the previously mentioned tools. The total number of students was 300 students.

#### Data collection tools:

The following tools were used for data collection:

#### First tool: Predesigned Questionnaire Format (Appendix II):

It was designed by the researcher in simple Arabic language after reviewing the related literature and studies. It was written in the form of close ended question (in the form of correct and incorrect, yes or no and matching) to suit the understanding level of the study subjects; it consisted of the following parts:

➤**Part I:** It was used to assess demographic characteristics of the studied student. It included (12 Questions) including the following, their gender, age, level of primary education, school attendance regularity, birth order, and number of the siblings. Also, data about the parents included their level of education, occupation, residence and the number of rooms.

➤**Part II:** This part was designed to assess the school environment and included (11 Question) including the following items: school cleanliness, number of bathrooms in the school presence of canteen in the school , type of food bought by canteen , presence of visitor in the school , type of education given by visitor , check-up done for students , how Many time checkup is done/year, type of the examination and sporting activities.

➤**Part III:** This part was designed to assess students' knowledge regarding healthy nutrition. it included (8 Questions) including the following: definition of healthy food, importance of healthy nutrition, the basic components of healthy food, meaning of nutritional pattern, examples of patterns of healthy food, food sources rich in proteins, food sources rich in carbohydrates, and food sources rich in vitamins and minerals.

➤**Second tool: Assessment sheet for the students' nutritional practice (Appendix III):** it consisted of the following parts:

➤ **Part I: Students' reported practice regarding healthy students' nutritional pattern**

This part was designed to assess students' reported practice regarding healthy nutritional pattern it included (10 Questions) including the following: eat while watching TV, eat while playing on computer or mobile, eat candy/chips/fast food, take sandwiches daily from home, regular time of the basic meals (breakfast/lunch/dinner), adhere to the daily breakfast, adhere to the daily lunch adhere to the daily dinner and number of practicing sports.

➤ **Part II: Assessment for the students' nutritional pattern:**

It included the types of foods taken, food likes and dislikes, number of regular meals, number of snacks/day and physical exercises.

➤ **Third tool: Assessment for the students' health status (Appendix IV):** it consisted of the following parts:

➤ **Part 1:** this part included data about assessment for occurrence of gastrointestinal problems, and data about the previous hospitalization of the studied students and its causes.

➤ **Part 2: Physical examination sheet:**

This part of the tool was adopted by *Duderstadt, (2013)*, it includes assessment of all body parts to detected signs of nutritional deficiencies such as skin, hair, lips, eyes, face, tongue, lips, teeth, gums, nails (heart beats and general appearance).

➤ **Part 3: include**

**A: Students' anthropometric measurements:**

This part of the tool was adopted by *Javed et al., (2015)*: it consisted of 3 items related to anthropometric measurement including body weight in kilogram using standard scale, and measurement of height in centimeter using a standard tape. Weight and height were used to calculate (BMI) utilizing the following formula.

$$\text{BMI} = \frac{\text{Weight}}{(\text{Height})^2}$$

Accordingly the BMI was considered as the following (Appendix VII):

Less than 18.5 percentile (underweight)  
 From 18.5 to 24.9 percentile (normal weight)  
 From 25 to 29.9 percentile (over weight)  
 From 30 to 39.9 percentile (obese)

(*Sukhonthachit et al., 2016*).

**B: Mid-Upper Arm Circumference (MUAC):** Is the circumference of the left upper arm, measured at the mid-point between the tip of the shoulder and the tip of the elbow (olecranon process and the acromium). MUAC is used for the assessment of nutritional status. It is a good predictor of mortality, MUAC predicted death in students better than any other anthropometric indicator. This advantage of MUAC was greatest when the period of follow-up was short (*Ralston and Myatt, 2016*).

**Content Validity:**

Content validity was ascertained by panel of three experts of pediatric nursing to

review the tools clarity, relevance and comprehensiveness. Their opinions were elicited regarding the format, layout, consistency, accuracy and relevancy of the tool, based on experts' comments and recommendations; minor modifications had been done.

#### **Reliability:**

Data collection tool reliability was tested using Cronbach Alpha and the result was 0.82 for interview questionnaire sheet, 0.91 for physical examination sheet, 0.86 for body mass index measurement, and 0.87 for mid-upper arm circumference measurement.

#### **Pilot study:**

A pilot study was done on 10% (30 students) of the expected sample size children to test the feasibility of the study, application of tools, content validity and estimate the time required for filling the tool and no modifications were done.

#### **Field work:**

The study was carried out three days per week during morning day over six months period from November 2018 to April 2019 using the previously mentioned study tools.

The researcher explained the purpose of the study to the student before starting the data collection where each student answered the questions individually. The researcher distributes the questionnaire sheet to students, students answered the questionnaire sheet and return it to the researcher in the same day. Questionnaire sheet took 20 minutes to be completed by the student.

Then, physical examination of each student was done by the researcher who examined them and measure their weight,

height, and mid upper arm circumference. Physical examination process took from 20 to 30 minutes for each student and immediate recording of examination results was done.

Data were collected in the presence of researcher for clarifications and answering questions. After receiving the completed tools, the researcher took the study tools to complete the study process.

#### **Ethical considerations:**

The protocol was reviewed from Research Ethical Committee of Faculty of Nursing Ain Shams University. Each study subject was informed that the study is harmless, confidentiality of data was kept and all the gathered data was used for research purpose only. Oral acceptance was taken from each student and from each school manager before data collection.

The study subjects have the right to withdraw from the study whenever they want. When it is possible the study subjects would be provided with feedback about the research outcomes.

#### **Administrative design:**

An official permission to carry out the study was obtained from Dean of the Faculty of Nursing Ain Shams University and approved from the directorate of education at New Valley governorate. Also, an approval form was obtained from directors of the above-mentioned schools to conduct the study.

#### **Statistical analysis**

Upon completion of data collection, the data were scored, tabulated and analyzed by computer using the Statistical Package for Social Science (SPSS) Version 25. Descriptive statistics such as frequency

distribution, mean score and standard deviation were utilized in analyzing data pretended in this study. Also, Pearson correlation, independent chi square test was used to analyze the relationships between the study variables. Significances were fixed at (P value  $\leq$  0.05).

## Results

**Table (1):** showed that nearly two thirds (65.3%) of the studied children were 10-11 years old with  $\bar{X} \pm SD = 9.92 \pm 1.11$  years, more than two thirds (71.7%) of them had 1-2 siblings, and more than one third (34.7%) of them were the second in their families.

Figure (1): showed that the great majority (95%) of the studied children attended to their school regularly.

**Table (2):** shows that more than two thirds (71.9%) of studied children were underweight with  $\bar{X} \pm SD = 17.84 \pm 3.37$ .

**Figure (2):** showed that 82.1% of the studied children have satisfactory total knowledge about meaning of food pattern and 83.1% of them have satisfactory total knowledge about pattern of healthy nutrition.

**Table (3)** showed that 84.6% of the studied children did not eat candy, chips, and fast food, while the great majority (95.7%) of them were practice sports.

**Table (4):** shows that there was statistically significant weak positive correlation between the studied children knowledge and their reported practice regarding proper nutrition ( $r=.097$ ).

**Table (5):** showed that there was statistically significant very weak positive correlation ( $r=.006$ ,  $P=.015$ ) between children's reported practice and their weight. Also, there was statistically significant very weak positive correlation ( $r=.042$ ,  $P=.04$ ) between children's reported practice and their BMI.

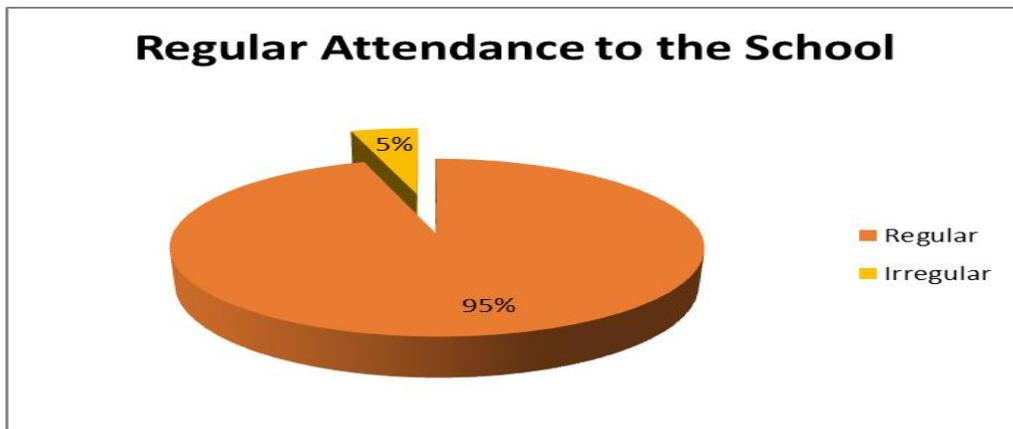
**Table (6):** showed that there was a highly statistically significant weak negative correlation between the studied children knowledge and their age ( $r=-.226$ ).

**Table (7):** shows that there were insignificant statistical differences in knowledge ( $\chi^2 = 2.15$ ,  $p=0.09$ ) and their gender.

**Table (8):** shows that there was insignificant statistical differences in the studied children reported knowledge ( $\chi^2=5.51$ ,  $p=.24$ ), and their rank.

**Table (1):** Number and percentage distribution of the studied children according to their characteristics (n=300).

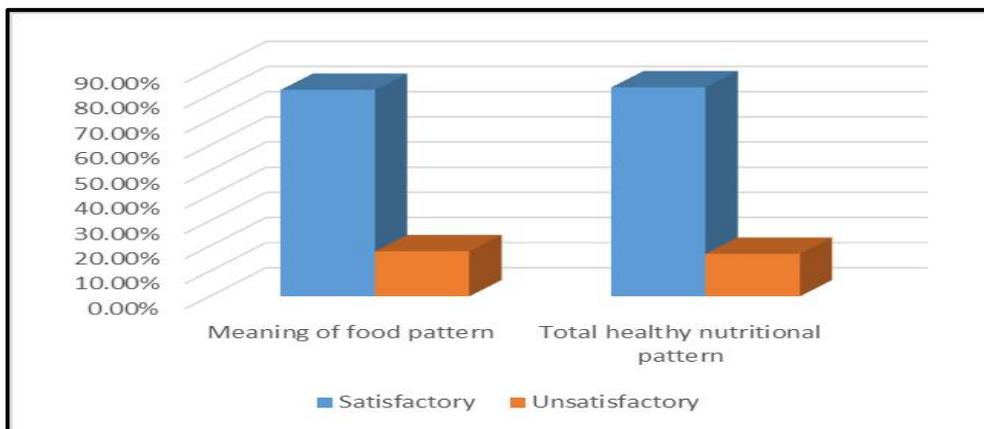
Items	No.	%
<b>Age / years</b>		
- 8->9 years	114	34.7
- 10 ->11years	196	65.3
$X \pm SD = 9.92 \pm 1.11$		
<b>Number of siblings</b>		
- 1-2	215	71.7
- 2-4	78	26
- 5-7	7	2.3
<b>Child's ranking</b>		
- First	96	32
- The second	104	34.7
- Third	71	23.7
- Fourth	24	8
- Fifth	5	1.7



**Figure (1):** Percentage distribution of the studied children according to their regular attendance to school (n=300).

**Table (2):** Number and percentage distribution of the studied children according to their measurement of Body Mass Index (n=300).

Body Mass Index (BMI)	No.	%
Underweight (BMI <18.5)	216	71.9
Normal weight (BMI 18.5-<25)	68	22.7
Overweight (BMI 25-<30)	13	4.3
Obese (BMI 30-<35)	4	1
$X \pm SD = 17.84 \pm 3.37$		



**Figure (2):** Percentage distribution of the studied children's total knowledge regarding the meaning of food pattern and healthy nutritional pattern (n=300).

**Table (3):** Number and percentage distribution of the studied children reported practices regarding proper nutrition (n=300).

Items	No		Yes	
	No.	%	No.	%
Eat while watching TV	213	71	87	29
Eat while playing on computer or mobile	144	48.5	153	51.5
Eat candy / chips / fast food	253	<b>84.6</b>	46	15.4
Take sandwiches daily from home	198	66	102	34
Regular time of the basic meals	81	27	219	73
Adhere to the daily breakfast	26	8.7	274	91.3
Adhere to the daily lunch	31	10.3	269	89.7
Adhere to the daily dinner	45	15	255	85
Practice sports	13	4.3	287	<b>95.7</b>

**Table (4):** Correlation between the studied children knowledge and their reported practice regarding proper nutrition (n=300).

Dimensions	Mean	SD	Pearson Correlation	
			r	p
Knowledge	13.1946	2.39156	.097	.04
Reported practice	14.7811	2.03248		

\*P value is significant at level <0.05

**Table (5):** correlation between the studied children reported practice and their anthropometric measurements (n=300).

Reported practice	Pearson correlation	
Anthropometric measurement	R	P
Weight	.015	.006
Height	.316	.058
MUAC	.487	-.040-
BMI	.04	.042

\*P value is significant at level &lt;0.05

**Table (6):** Correlation between the studied children age, Number of brothers/sisters, their knowledge and reported practice regarding proper nutrition (n=300).

Dimensions	Pearson Correlation	Age	Number of sisters/brothers
Knowledge	R	-.226-	.047
	P	.000	.416
Reported practice	R	.090	.071
	P	.121	.222

\*P value is significant at level &lt;0.05

**Table (7):** The relation between the studied children knowledge and their gender (n=300).

Variables	Level	Frequency distribution	Gender		Chi square test	
			Male	Female	$\chi^2$	p
Knowledge	Unsatisfactory	No.	51	43	2.15	.09
		%	35.4	27.6		
	Satisfactory	No.	93	113		
		%	64.6	72.4		

(\*) P value is significant at level &lt;0.05

**Table (8):** The relation between the studied children knowledge and their rank (n=300).

Variables	Level	Frequency distribution	Child rank					Chi square test	
			1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	$\chi^2$	p
Knowledge	Unsatisfactory	No.	31	38	15	9	1	5.51	.24
		%	32.3	36.5	21.1	37.5	20		
	Satisfactory	No.	65	66	56	15	4		
		%	67.7	63.5	78.9	62.5	80		

\*P value is significant at level &lt;0.05

## Discussion

Health nutritional pattern is cornerstone for growing children during early childhood and school-age years;

children begin to establish habits for eating and exercise that stick with them for their entire lives. If children establish healthy habits, their risk for developing many chronic diseases will be greatly

decreased. Nutrition is a significant factor in the growth, development, and overall functioning of a child. Good nutrition provides the energy and nutrients essential to sustain life and promote physical, social, emotional, and cognitive development. During early childhood, the body is growing at an alarming rate. This rate slows down after age 1 year and may occur in spurts throughout childhood, adolescence, and puberty (**Mehdizadeh et al., 2018**).

Regarding the socio-demographic characteristics of the studied children **Table (1)**, the present study showed that more than two thirds of them were 10-11 years old with ( $X \pm SD = 9.92 \pm 1.11$ ) years. This result came in the line with (**Debbarma, Debbarma, & Nath, 2018**) who studied "nutritional health status of rural tribal children in Khowai district of Tripura, India and reported that more than two thirds of the studied sample their age were 10-12 years old. Also, the current study came in agree with (**Kigaru, Loechl, Moleah, Macharia-Mutie, & Ndungu, 2015**) who studied "nutrition knowledge, attitude and practices among urban primary school children in Nairobi City, Kenya: a KAP study" and reported that more than two third of the studied sample were 10-11 years old and the Mean age was  $10.07 \pm 0.9SD$ . This age was selected by the investigator to represent the preschool stage.

Regarding the number of siblings, the present study showed that each child of the studied sample had 1-2 siblings, and more than one third of them were the second in their families. This result came in the line with (**Abdelaziz, Youssef, Sedrak, & Labib, 2015**) who studied "nutritional Status and Dietary Habits of School Children in Beni-Suef

Governorate, Egypt" mentioned that most of the students have from 1-3 siblings.

Regarding the distribution of the studied children according to their regular attendance to school, **Figure (1)**, the present study founded that the great majority of the studied children attended to their school regularly. This result came in accordance with (**Olugbemi et al., 2019**) who studied nutritional status of day and boarding students attending school for special needs in North-central Nigeria and founded that all of studied children attended their school regularly. From the researcher point of view, this result may be due to the interesting of parents with education where majority of parents have good educational level.

Regarding anthropometric measurements **Table (2)**, the current study showed that more than two thirds of the studied sample were underweight in BMI with  $X \pm SD = 17.84 \pm 3.37$ , the majority had abnormal weight, height and mid upper arm circumference. From the researcher point of view, this result may be due to low healthy nutritional status of children that result in low knowledge about healthy nutritional pattern.

This result came in agree with (**Shivaprakash & Joseph, 2014**) who stated that slightly less than one third of the studied sample were under weight. This result came inconsistent with (**Aristizabal, Barona, Hoyos, Ruiz, & Marín, 2015**) who studied "association between anthropometric indices and cardio metabolic risk factors in school children" who reported that more than half of the boys and the girls were of normal body weight.

Moreover, (**Manyanga, El-Sayed, Doku, and Randall (2014)**) who studied "the prevalence of underweight,

overweight, obesity and associated risk factors among school-going adolescents in seven African countries" reported Unadjusted rates of being underweight varied from 12.6% (Egypt) to 31.9% (Djibouti). Rates of being overweight varied from 8.7% (Ghana) to 31.4% (Egypt). Rates of obesity ranged from 0.6% (Benin) to 9.3% (Egypt). From the researcher point of view, it might be due to over activity of student.

Regarding distribution of the studied children's total knowledge regarding the meaning of food pattern and pattern of healthy nutrition **Figure (2)**, the current study founded that the most of studied children had satisfactory knowledge about food pattern. This result came in the line with (*Kigaru et al., 2015*) who studied "nutrition knowledge, attitude and practices among urban primary school children in Nairobi City, Kenya: a KAP study" and reported that the pupils were found to be weak in identifying the role of various food groups in the knowledge test. Only 21 % were able to correctly identify the best source of energy food group while 54 % could not identify the group of nutrients that is good for building body muscles. From the researcher point of view, it might be due school taught the student about food pattern and pattern of healthy nutrition.

Regarding distribution of the studied children reported practices regarding proper nutrition **Table (3)**, the current study showed that, the most of the studied children did not eat candy / chips / fast food, while the great majority of them were practice Sports.

This result came in the line with *Mässe, de Niet-Fitzgerald, Watts, Naylor, and Saewyc (2014)* who studied "associations between the school food

environment, student consumption and body mass index of Canadian adolescents." and reported that less than half of the school student reported healthy nutrition practices with average nutritional resources.

This came inconsistent with *Kigaru et al., (2015)* who reported that About the most of studied children ate food in front of TV unsupervised, more than two third of them had consumed sweetened beverages, only 9 % consumed fruits 4–7 times a week and almost all study children carried money to school and made decision on foods to buy chips, candies, sausages and smokes, doughnuts and chocolate were preferred snacks. From the researcher point of view, it might be due parent give the students instruction that ate (chips/fast food/candy) lead to health harmful.

Regarding correlation between the studied children knowledge and their reported practice regarding proper nutrition **table (4)**, the present study showed that there was statistically significant weak positive correlation between the studied children knowledge and their reported practice regarding proper nutrition ( $r=.097$ ,  $p=.04$ ). this result came in agree with (*Kigaru et al., 2015*) who reported that children nutrition knowledge had no significant relationship with dietary practices, but attitude had.

Regarding correlation between the studied children reported practice and their anthropometric measurements **table (5)**, the present study showed that there was statistically significant very weak positive correlation ( $r=.006$ ,  $P=.015$ ) between reported practice and weight. Also, there was statistically significant very weak positive correlation ( $r=.042$ ,  $P=.04$ ) between reported practice and BMI.

In contrast to the current study *El-Nmer et al., (2014)* who studied "nutritional knowledge, attitude, and practice of parents and its impact on growth of their children" reported that there was no significant correlation between nutritional practice of children and their BMI and height, whereas there was significant correlation between nutritional practice of children and their weight.

Also *El-Nmer et al., (2014)* reported that no significant correlation was found between nutritional practice and children's height and body mass index. This might be due to the BMI directly depending on the nutritional practices. If the nutritional practices were good, the BMI will be in normal range and vice versa.

Regarding to correlation between the studied children age and their knowledge **Table (6)**, the present study showed that there was a highly statistically significant between the studied children knowledge and their age. This result came inconsistent with **Moreno-Maldonado et al., (2018)** who reported that "with respect to age, significant differences were found for breakfast ( $p < 0.001$ ) and candy consumption ( $p < 0.05$ ) and the older children were less likely to eat breakfast daily (and more likely to eat candy).

This result also were supported by **Hassan et al., (2017)** who studied "Nutritional Status and Some Socio-demographic and Lifestyle Characteristics among A Group of Rural School Children in Fayoum Governorate, Egypt" and reported malnutrition significantly associated with children age.

Regarding the relation between the studied children knowledge and their

gender **Table (7)**, the present study illustrated that there were insignificant statistical differences in knowledge and their gender. This result came in accordance with (**Kigaru et al., 2015**) who reported that There was no significant difference ( $P > 0.05$ ) between sexes. Also this result came inconsistent with (**Naeeni et al., 2014**) who studied "Nutritional Knowledge, Practice, and Dietary Habits among school Children and Adolescents" and reported that Nutritional knowledge of female pupils and junior high school students was higher than their male. This were supported with (**Hassan et al., 2017**) who mentioned that malnutrition is significantly associated with children gender.

Regarding the relation between the studied children knowledge and their rank **Table (8)**, the present study showed there was insignificant statistical differences in the studied children reported knowledge ( $\chi^2 = 5.51$ ,  $p = .24$ ), and their rank. This result came inconsistent with (**Naeeni et al., 2014**) who reported that junior high school students had significantly higher knowledge score on this issue than younger ones ( $P < 0.001$ ). This result might be due to the older children have more knowledge than the younger children.

## Conclusion

Based on the findings of the present study, it can be concluded that more than two thirds of studied students had satisfactory total knowledge regarding healthy nutritional pattern while, the majority of their had unsatisfactory total practice regarding healthy nutritional pattern. Also, there was statistically significant very weak positive correlation between studied students reported practice and their BMI,

while a negative correlation was founded between level of the studied students reported practice and Mid Upper Arm Circumference.

### **Recommendations:**

The following recommendations were reached in the light of the study results: -

1.The school should Provide nutritional programs for the students, aiming to improve nutritional pattern through health educational instructions.

2.Involve teachers, school personnel, parents, communities, and local government in the development and implementation of school nutrition programs.

3.Integration of nutrition education into the school activities for all age groups.

4.Nutritional education should always employ a wide range of hands-on teaching/learning methods that can be applied through mass media in the classrooms of schools.

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There was no external funding for this research.

### **Conflicts of Interest**

The authors declare that there was no conflict of interest.

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