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School Age children's Awareness regarding Obesity Prevention

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تحذف Editing and spaces

ABSTRACT

Background: Childhood obesity is associated with multiple comorbidities that can result in both short- and long-term complications. It can lead to breathing difficulties, obstructive sleep apnea, asthma, musculoskeletal issues, insulin resistance, hypertension, and psychological problems in children. Many of these conditions persist into adulthood, increasing the risk of type 2 diabetes, heart disease, and mortality in middle age. **Aim of the Study**: This study aimed to assess children's awareness regarding obesity prevention. **Design**: A descriptive cross-sectional study was utilized. **Setting**: The study was conducted at Abu Bakr As-Siddiq Primary School and El Sherouk Primary School in Beni Suef City. **Sample**: A purposive sample of 200 children from the mentioned schools was included. **Tools**: Two tools were used for data collection: The first tool: structured interview questionnaire to assess children's knowledge about obesity prevention. the second tool measure children's attitudes regarding obesity prevention. **Results**: The majority of the study sample demonstrated an unsatisfactory overall level of knowledge, and less than two-thirds had a negative attitude regarding obesity prevention. **Conclusion**: A highly statistically significant relationship was found between children's total knowledge and their overall attitude obesity prevention. Additionally, a strong positive correlation was observed between the total level of children's knowledge and their attitude toward obesity prevention. **Recommendation**: Educational training programs should be conducted periodically to enhance students' knowledge and improve their attitudes toward obesity prevention.

Key words: School Age, Awareness, Obesity ,Prevention.

INTRODUCTION

Children at age 6-12years spend the majority of their waking hours in school. Therefore, the school setting provides access to large numbers of children and is a critical environment for introducing health services and strategies and promoting health behaviors **(Aktaş et al.,2023)**.

School age group among 6 to 12 years is a stage of life where a child's habits and behaviors can be greatly affected, enabling them to change any undesirable habits they may have picked up earlier. Children participate in certain behaviors, including lifetime activities, and spend a large amount of time in school. Designing primary preventive strategies that target childhood obesity and overweight in schools is therefore a top concern. **(Ríos-Castillo et al., 2024)**.

Obesity and overweight have long-term effects that extend into adulthood; in fact, they can be impacted by behavioral, mental, and musculoskeletal disorders as well as gastrointestinal disorders. Additionally, they are more likely to develop type 2 diabetes and insulin resistance early in life,

cardiovascular disease, cancers, premature death and disability. Obese children in particular experience cardio-metabolic alterations at a young age, which increases their risk of cardiovascular disease as adults and, as a result, of premature morbidity and death. **(Guarino et al., 2023).**

Childhood obesity has crucial complications may be health-related, including liver issues, chronic inflammation, asthma, and abnormalities of the joints. either dyslipidemia that may affect visits and hospital admissions. Additionally, They may also experience psychological problems including low self-esteem, which increases their likelihood of developing a more severe psychosocial condition that could result in depression, as well as difficulties in their social and academic lives**(Mohamed et al.,2022)**.

Childhood obesity may be caused by a variety of factors, including the consumption of high-calorie foods with little to no physical activity, psychological factors like anxiety and stress in the family, socioeconomic and psychological factors, and social isolation. The main causes of the growing problem of overweight and obesity are changing lifestyles brought about by the expanding economy, technology, and globalization **(Musa et al., 2024)**.

Pediatric school nurse's play a vital role, to reduce school-based obesity prevention programs for risk factors and the rising interest in offering primary and secondary preventive services for school-age children's obesity in order to reduce childhood obesity rates **(Pettigrew et al., 2023)**

Pediatric School nurses can take precautions to lower the risk of obesity or overweight, and can act as educators and role models for school children in developing healthy dietary and physical activity habits. In the management of obesity, nursing interventions such as education, care, and support are important for devising, implementing, and evaluating strategies to solve the problem of obesity in children **(Machado et al .,2023)**.

Significance of the study

severe, chronic, progressive, relapsing, and treatable multifactorial, neurobehavioral disease, wherein an increase in adiposity promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences," is how the Obesity Medicine Association (OMA) defines obesity **(Bays et al., 2024).**

Obesity in children is considered a significant public health concern both nationally and globally, as it results in several health problems and long-term psychosocial complications. In addition to, this concern has been growing due to overweight and obesity, showing an increase worldwide of more than 340 million children being overweight and obese**(Cabral et al ., 2023)**.

According to the WHO, obesity raises the risk of non-communicable diseases and results in over 1.2 million deaths annually in Europe, according to the WHO. Therefore, children who are overweight suffer from physical, metabolic, and self-esteem issues, including insulin resistance, hepatic and cardiovascular diseases, type II diabetes, hypertension, apnea syndrome, various cancers, a lower quality of life, and psychopathological disorders.

(Cabral et al ., 2023).

The Ministry of Health and Population reports that 10,837,000 primary school pupils have undergone screening for stunting, obesity, and anemia. According to the government screening about 15 million Egyptians at 29,444 private and public primary schools is the year's objective **(Egypt Today Staff., 2022).**

Egypt ranks 18th globally in terms of obesity prevalence. Non-communicable diseases contribute to nearly 71% of all deaths **(Aboulghate et al., 2021)**. More than 10% of Egyptian children, approximately 3.6 million, are significantly overweight. Developing effective intervention strategies to address childhood obesity is essential**(Ahmed et al ., 2022)**.

AIM OF THE STUDY

Aim of study is to assess school age children's awareness regarding obesity prevention through:

1-Assessing school age children's knowledge level regarding obesity prevention .

2-Assessing School age children's attitude level regarding obesity prevention.

Research questions:

The present study was intended to answer the following questions:

1-What is the knowledge level of school age children's regarding obesity prevention?

2-What is the attitude level of school age children's regarding obesity prevention?

SUBJECT AND METHODS

The subject and methods for this study were portrayed under the four main designs as follows:

I-Technical design

II- Operational design.

III- Administrative design.

IV-Statistical design.

I- Technical design:

The technical design included research design, setting, subject and tools for data collection.

Research design:

A descriptive cross sectional study was utilized for the current study.

Research setting:

The study was conducted in Abu Baker As-siddiq primary school and El Sherouk Primary school at Beni -Suef city

Research subject:

A purposive sample of (200) children the previously mentioned setting was included in the study, after fulfilling the following criteria:

Inclusion criteria:

Children age between 6-12 years.

Agree to participate the research subject.

clusion criteria:

Children whose exact birth date was not available.

Refuse to participate the research subject.

Sample size:

1400*(0.5*0.5) = 350

1399*(0.004096 / 3.8416) = 1399*0.001066=

1.49133+0.25= 1.74133

N=200 children

According to the previous equation the sample size was 200 nurses.

Tools for data collection

This study employed two specially designed tools, which were developed by the researcher following an extensive review of relevant literature.

It was designed and developed by investigator in Arabic language in form of closed questions

The researcher designed the tool in the light of relevant literature, It covering three parts.

Tool I:Structure Interviewingquestionnaire sheet

Part A: Demographic Characteristics of Children

This section focuses on various demographic factors of children, including age, gender, school name, place of residence, birth order within the family, as well as the father's and mother's educational levels and occupations.

Part B: Family and Medical History

This section covers the family and medical background of primary school students, including a family history of obesity and the presence of any health conditions adopted from **Niedzwiecki et al., (2020). 3 steps for BMI).**

WHO criteria were used to calculate BMI in classifying participants as underweight (BMI≤18.5 kg/m2), normal weight (BMI 18.5–24.9 kg/m2), overweight (BMI 25.0–29.9 kg/m2) and obese (BMI≥ 30.0 kg/m2)

Part C: Knowledge questionnaire for children.

This adapted from **(Prevein PR et al., 2020)** to measure children's knowledge toward obesity prevention. It contained 16 questions grouped under five major components that included concept of obesity (3questions),risk

factor of obesity(4questions), complication of obesity (2 questions), prevention of obesity (5 questions) and management of obesity(contained 2 questions).

Children's knowledge was scored as the following:

The studied children's answers were compared with model key answers: where one (1) score for correct answer and zero for (0) score for incorrect answer. Total knowledge scores ranged from (0:16)points. In this respect the level of children's knowledge of was categorized as the following:

Satisfactory level of knowledge(≥75%) ranged from (12≥16)points and unsatisfactory level of knowledge (<75%) ranged from(0 <12)points.

Tool II : - Children's attitude Likert scale regarding obesity prevention.

It was adapted from adapted from **(Wasfy et al., 2008)** to observe children's attitude about obesity prevention. It contained 18 items grouped under four components that included meaning of obesity (1 items), risk factor and causes of obesity (4 items) complication of obesity (2 items). Finally, prevention of obesity (11 items).

Children's attitude was scored as the following:

The studied children's answers were compared with model key answers: where two(2) score for agree answer , one (1) score for neutral answer and zero for (0) score for disagree answer. Total attitude scores ranged from (0:36)points. In this respect the level attitude of children's of was categorized as the following:

Positive level of attitude (≥60%) ranged from (22≤36)points and negative level of attitude (<60%) ranged from(0 <22)points.

Tools Validity

The tools for data collection were evaluated for their content validity by a panel of three experts specializing in pediatric and community nursing from the Faculty of Nursing at Helwan University, Al-Fayoum University, and Beni Suef University. These experts were selected to assess the content validity of the tools and to evaluate their clarity, relevance, comprehensiveness, simplicity, understand ability, and applicability. Minor modifications were made based on their feedback. Their opinions were gathered regarding paraphrasing, adding or removing certain items, and adjusting the layout and format of the questions. All their remarks were considered, and the tools were deemed valid from the experts' perspective.

Tools Reliability:

The reliability of the tools was assessed to evaluate the degree of consistency among the questionnaire items. Cronbach's Alpha was used to measure the internal reliability of the tool. It was (0.706) for knowledge questionnaire and (0.795) for attitude tool by Alpha Cronbach reliability analysis test that, indicating to internal consistency of scores on the measure.

Ethical Considerations

Before conducting the pilot study, ethical approval was obtained from the Research Ethics Committee of the Faculty of Medicine, Beni Suef University. Official permission was also secured from the relevant authorities in the selected schools. Informed consent, either written or oral, was obtained from all children after explaining the study's purpose and nature to them before the interview. The investigators emphasized that participation in the study was entirely voluntary, and anonymity and confidentiality were maintained through data coding. Additionally, participants were assured of their right to withdraw at any time.

II-Operational design

The operational design included preparatory phase, pilot study, and field work.

Preparatory Phase

The investigator reviewed current and previous local and international literature, along with theoretical knowledge related to various aspects of the study. This was done using books, articles, journals, and online sources to develop the data collection tools.

Pilot study

A pilot study was conducted in October 2023 on 10% of the total study sample (20 out of 200 participants) to assess the clarity of the questions, the feasibility of the study, the

objectivity of the tools, and the time required to complete them. Based on the results, no modifications were necessary. Participants in the pilot study were included in the main study sample.

Field work

The actual fieldwork was conducted over four months, from October 2023 to the end of January 2024. For data collection, each student was individually interviewed and assessed using the study tools. The researcher was present at the study setting every Sunday and Monday from 9:00 AM to 2:00 PM. The process began with the researcher introducing herself to the students and providing a brief explanation of the study's aim to gain their cooperation. She also explained how to complete the knowledge questionnaire while assuring the students of the anonymity and confidentiality of their responses, emphasizing that the information would be used solely for scientific research. The time required to complete the questionnaire ranged from 15 to 20 minutes. Regarding students' attitudes, the time taken to answer the attitude-related section was also 15 to 20 minutes.During data collection of tool sometimes explained some points for some student any misunderstanding. The terms such as body mass index (BMI), diabetes, were difficult for the students to understand. Some students need to reading due to poor educational level and inability to reading.

III-Administrative design

A written approval letter to carried out this study was obtained from Dean of Faculty of Nursing, Beni-Suef University. The letter was being directed to the general manger of Abu Bakre As-siddiq primary School and general manger El Sherouk Primary school at Beni –Suef governorate. Both mentioned school mangers asking for cooperation and permissions to conducting this study. After explanation of the study aim, an official permission was obtained from the Dean of Faculty of Nursing and mangers of mentioned schools in Beni Suef governorate. Consent was obtained from children ensuring complete privacy and total confidentiality.

IV-Statistical design

Data analysis was performed using SPSS Statistics, version 24. Descriptive statistics were employed to summarize the data, with qualitative variables presented as frequencies and percentages, and quantitative variables expressed as means and standard deviations (Mean ± SD).Probability (p-value) is the degree of significance, The results were considered statistically significant when the p-value was less than 0.05. A highly statistically significant association was indicated by a p-value less than 0.001 (*). No statistically significant relationship was observed when the p-value exceeded 0.05. The results were considered statistically significant when the p-value was less than 0.05. A highly statistically significant association was indicated by a p-value less than 0.001 (*). No statistically significant relationship was observed when the p-value exceeded 0.05. And, the correlation between variables was done by using the Pearson coefficient test. Test for association was done by chi-square test to compare between two or more group.

Results

Results tabulated and presented in figures, graphs, and tables and analysed by using appropriate statistical tests

RESULTS

Table (1): Concerning the characteristics of the studied children, the current study presented that, more than half were age group from 9 to 12 years with mean age of the studied primary school children were 9.26 ±1.829 years, more than half had residence rural area, less than half had male gender, more than half had female gender , represented that most all of father job were worker ,the majority of mothers were housewives and less than half had intermediate education for education mother and father respectively.

Table(2): The present study showed that a majority of the participating children demonstrated accurate knowledge about the definition and symptoms of obesity. However, more than half of the children exhibited misconceptions regarding the

causes of obesity. The study revealed that a significant proportion of the participating children lacked accurate knowledge about the eating habits that contribute to overweight and obesity as well as the specific foods and beverages that increase the risk of overweight and obesity. Furthermore, approximately two-thirds and over half of the children demonstrated inadequate understanding of the factors that increase the likelihood of developing obesity.

Table(3); The current demonstrated that, about two thirds and about three quarter of the studied children had incorrect knowledge regarding physiological and psychological complications of obesity, respectively. more than half of the studied children had incorrect knowledge regarding ways of prevention of obesity related to healthy eating habits and food, more than two thirds and less than two thirds of them had incorrect knowledge Regarding children's knowledge about management of obesity, more than half of the studied children had incorrect knowledge regarding the importance of physical activity and more than two thirds of them had incorrect knowledge regarding the ways that can help in loss of excess weight. Regarding ways of prevention of obesity related physical activity or exercise and way of prevention during school day related children's habits for avoid obesity, respectively.

Figure (1): Regarding total knowledge of school children, the current study relieved that the majority of student had unsatisfactory total knowledge regarding obesity prevention While, 13.0% minority of them had satisfactory level of total knowledge.

Table(4): Regarding attitude of school children, the current study announced that, more than half of them neutral attitude that, Obese children feel psychologically unstable and avoiding excessive use of social media reducing the risk of obesity, respectively

Figure (2): Presented that, 63.0% more than one third of the studied children had negative attitude regarding obesity prevention. While, 37.0% less than two thirds of them had positive attitude.

Table(4): Analysis of the relationships between demographic characteristics, family and health history of the studied children, and their total knowledge revealed a highly statistically significant association between children's total knowledge and their .

Table(5): The analysis revealed a highly significant correlation between the children's total attitude towards obesity prevention and their demographic characteristics, particularly age.

Table(6): The findings showed a highly statistically significant positive correlation between the children's total knowledge and their total attitude towards obesity prevention.

Figure(2): Illustrated that, 63.0% less than two thirds of the studied children had negative attitude regarding obesity prevention. While, 37.0% more than one third of them had positive attitude.

Table (1): Frequency distribution of the studied children according to their demographic characteristics **(n=200).**

Demographic characteristics	No.	%
Age		
6-<9 years	84	42.0
9-12 years	**116**	**58.0**
Range	**6-12**	
Mean ± SD	**9.26±1.82**	
The child's arrangement among his siblings		
The first	59	29.5
The second	42	21.0
The third and more	**99**	**49.5**
Place of residence		
Rural	**115**	**57.5**
Urban	85	42.5
School name		
Abu Bakr Al-Siddiq School	**105**	**52.5**
Al-Shorouk School	95	47.5
Father's education level		
Illiterate	30	15.0
Read and write	40	20.0
Intermediate education	**86**	**43.0**
University education	44	22.0
Father's job		
Working	**200**	**100.0**
Do not work	0	0.0
Mother's education level		
Illiterate	40	20.0
Read and write	44	22.0
Intermediate education	**91**	**45.5**
University education	25	12.5
Mother's job		
Working	**163**	**81.5**
Do not work	37	18.5
Number of family members		
< 3	28	14.0
4 – 6	75	37.5
> 6	**97**	**48.5**

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Figure (1): Percentage distribution of the studied children according to their total attitude regarding obesity prevention (n=200).

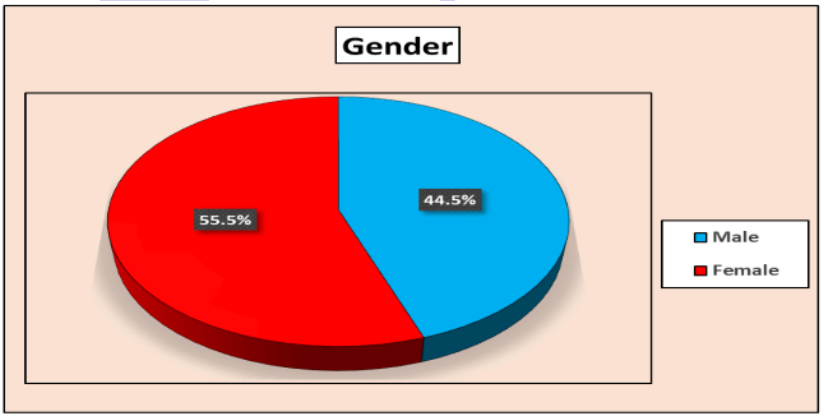

Table (2): Frequency distribution of the studied children according to their knowledge about concept and risk factors of obesity **(n=200)**.

Items	Correct answer		Incorrect answer	
	No.	%	No.	%
Concept of obesity				
Definition of obesity	**104**	**52.0**	96	48.0
Causes of obesity	63	31.5	**137**	**68.5**
Symptoms of obesity	**119**	**59.5**	81	40.5
Risk factors of obesity				
Factors that increase the incidence of obesity	67	33.5	**133**	**66.5**
High risk group of children for overweight and obesity	**125**	**62.5**	75	37.5
Habits of eating that lead to overweight and obesity	88	44.0	112	56.0
Food or fluid is a risk for overweight/obesity	86	43.0	**114**	**57.0**

Table (3): Frequency distribution of the studied children according to their knowledge about complications, prevention and management of obesity **(n=200)**

Items	Correct answer		Incorrect answer	
	No.	%	No.	%
Complications of obesity				
Physiological complications of obesity	67	33.5	133	66.5
Psychological complication of obesity	51	25.5	149	74.5
Prevention of obesity				
Ways of prevention of obesity related physical activity or exercise	65	32.5	135	67.5
Ways of prevention of obesity related to healthy eating habits and food	91	45.5	109	54.5
Ways of prevention related to social media for avoid overweight and obesity	81	40.5	119	59.5
Way of prevention during school day related children's habits for avoid obesity	70	35.0	130	65.0
The best method to prevent overweight and obesity	83	41.5	117	58.5
Management of obesity				
The importance of physical activity	83	41.5	117	58.5
The ways that can help in loss of excess weight	65	32.5	135	67.5

Figure (2): Percentage distribution of the studied children according to their total knowledge about obesity (n=200).

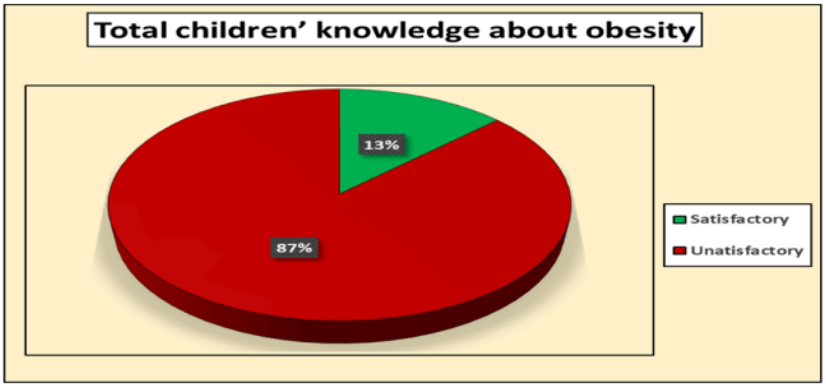

Table (4): Frequency distribution of the studied children according to their attitude

Statement	Agree		Neutral		Disagree	
	No.	%	No.	%	No.	%
Obesity is a big problem in children	102	51.0	71	35.5	27	13.5
The lack of sufficient information about a healthy diet leads to the spread of obesity	34	17.0	133	66.5	33	16.5
Feel that poverty may lead to obesity	35	17.5	93	46.5	72	36.0
Obese children feel psychologically and emotionally unstable	53	26.5	120	60.0	27	13.5
Incorrect eating habits are a major factor in the occurrence of obesity	49	24.5	118	59.0	33	16.5
The media pushes children to eat more unhealthy food	41	20.5	121	60.5	38	19.0
Avoiding excessive use of social media or eating in front of the TV contributes to reducing the risk of obesity	36	18.0	110	55.0	54	27.0
Avoiding eating while watching TV reduces the risk of obesity	35	17.5	129	64.5	36	18.0
Avoiding eating late at night reduces the risk of obesity	32	16.0	137	68.5	31	15.5
Practicing physical activity or sports helps prevent obesity	104	52.0	68	34.0	28	14.0
Obesity leads to diseases of the muscles and bones	48	24.0	104	48	48	24.0
Getting enough sleep 6 to 8 hours, contributes to preventing obesity	39	19.5	58	29.0	103	51.5
Parents have an important and effective role in modifying the healthy lifestyle of children and protecting them from obesity	64	32.0	101	50.5	35	17.5
A health system contributes to improving lifestyle and reducing the risk of disease	59	29.5	99	49.5	42	21.0
Eating small meals at frequent intervals contributes to preventing obesity	31	15.5	130	65.0	39	19.5
Eating fruits and vegetables contributes to reducing the risk of obesity	45	22.5	128	64.0	27	13.5
Total attitude score	**Range =** 9 - 31 **Mean ± SD =** 18.13 ± 5.57					

Figure (3):Percentage distribution of the studied children according to their total knowledge about obesity (n=200).

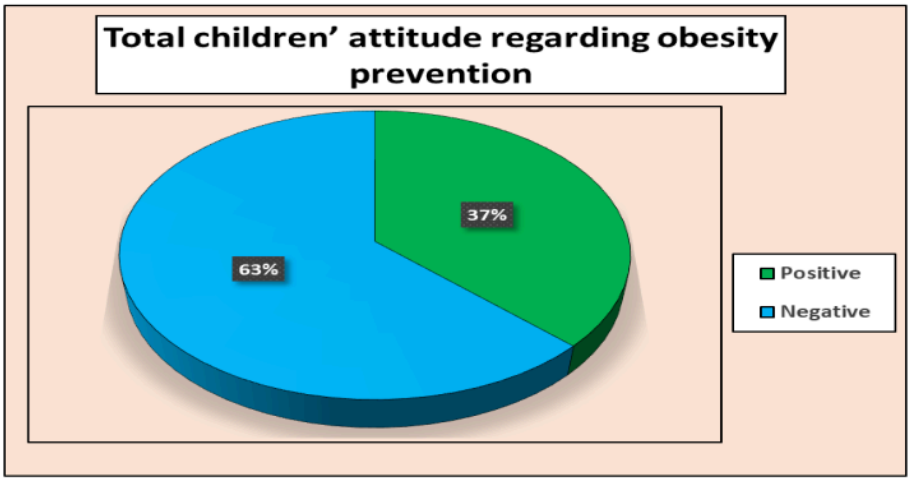

Table (5): Relation between demographic characteristics of the studied children and their total knowledge regarding obesity **(n=200).**

Demographic characteristics		No.	Total knowledge regarding obesity				X^2	P-Value
			Satisfactory (n=26)		Unsatisfactory (n=174)			
			No.	%	No.	%		
Age	6-<9 years	**84**	0	0.0	84	48.3	**FET**	0.000**
	9-12 years	**116**	26	100.0	90	51.7	0.000	
Gender	Male	**89**	12	46.2	77	44.3	0.033	0.856
	Female	**111**	14	53.8	97	55.7		
The child's arrangement among his siblings	The first	**59**	9	34.6	50	28.7	1.500	0.472
	The second	**42**	7	26.9	35	20.1		
	The third and more	**99**	10	38.5	89	51.2		
Place of residence	Rural	**115**	16	61.5	99	56.9	0.199	0.655
	Urban	**85**	10	38.5	75	43.1		
School name	Abu Bakr Al-Siddiq School	**105**	10	38.5	95	54.6	2.362	0.124
	Al-Shorouk School		16	61.5	79	45.4		

X^2= chi-square test. **FET**= Fisher's Exact Test. No statistically significant at p > 0.05. ** Highly statistically significant at p < 0.01.

Table (6): Relation between demographic characteristics of the studied children and their total attitude regarding obesity prevention **(n=200).**

Demographic characteristics		No.	Total attitude regarding obesity prevention				X^2	P-Value
			Positive (n=74)		Negative (n=126)			
			No.	%	No.	%		
Age	6-<9 years	**84**	6	8.1	78	61.9	55.38	0.000**
	9-12 years	**116**	68	91.9	48	38.1		
Gender	Male	**89**	31	41.9	58	46.0	0.324	0.570
	Female	**111**	43	58.1	68	54.0		
The child's arrangement among his siblings	The first	**59**	26	35.1	33	26.2	2.038	0.361
	The second	**42**	13	17.6	29	23.0		
	The third and more	**99**	35	47.3	64	50.8		
Place of residence	Rural	**115**	38	51.4	77	61.1	1.817	0.178
	Urban	**85**	36	48.6	49	38.9		
School name	Abu Bakr Al-Siddiq School	**105**	31	41.9	74	58.7	5.300	0.21*
	Al-Shorouk School	**95**	43	58.1	52	41.3		
	4 - 6	**75**	37	50.0	38	30.2		
	> 6	**97**	24	32.4	73	57.9		

X^2= chi-square test. FET= Fisher's Exact Test. No statistically significant at $p > 0.05$. * Statistically significant at $p < 0.05$.
** Highly statistically significant at $p < 0.01$.

Table (7): Relation between total knowledge regarding obesity of the studied children and their total attitude regarding obesity prevention **(n=200).**

Variables		No.	Total knowledge regarding obesity				FET	P-Value
			Satisfactory (n=26)		Unsatisfactory (n=174)			
			No.	%	No.	%		
Total attitude regarding obesity prevention	Positive	74	26	100.0	48	27.6	0.000	0.000**
	Negative	126	0	0.0	126	72.4		

FET= Fisher's Exact Test. ** Highly statistically significant at $p < 0.01$.

DISCUSSION

Overweight and obesity result from excessive fat accumulation caused by an imbalance between calorie intake and energy expenditure, which can negatively impact health. The effects of overweight and obesity begin in childhood and can have long-term consequences into adulthood. Children with obesity are at higher risk of developing gastrointestinal, musculoskeletal and orthopedic conditions, as well as behavioral and emotional challenges. Additionally, they face an increased likelihood of early-onset insulin resistance, type 2 diabetes, certain cancers, and a higher risk of premature death and disability in adulthood(**Guarino et al., 2023**).

Part (I): Demographic characteristics of the studied children.

Concerning the characteristics of the studied children, the current study presented that, more than half were in age group from 9 to 12 years with mean age of the studied primary school children were 9.26 ±1.829 years. This finding was accepted with **Liu et al.,(2022)**, who carried out a study which entitled "effectiveness of a multifaceted intervention for prevention of obesity in primary school children in china a cluster randomized clinical trial" and reported that, the mean age of the studied primary school children was 9.6 years . In addition to, this finding was agreed with **Abdel Hakeem et al ., (2022)** who carried out a study at El-Salam city, Cairo governorate -Egypt which entitled "childhood obesity and healthy weight program among primary school children" and showed that, more than half were in age group from 9 to 12 years. This findings was in agreement with. this current study disagreed with **Abduelkarem et al., (2020)**, who conducted study at Sharjah, United Arab Emirates which entitled "obesity and its associated risk factors among school-aged children in sharjah, uae" and presented that The mean age of the pupils was 8.2 years, with a standard deviation of 1.7 years.

Regarding the characteristics of residence the studied children showed that, more than half had residence rural area. Bedside, this study accepted with **Ray et al., (2023),** who conducted a study which entitled "childhood obesity: a cross-sectional study among children aged 6–12 years attending pediatric outpatient department of a tertiary care teaching hospital in kolkata, india" and found that , a little more than two-thirds come from rural areas. While, this finding was disagreed with **Hamad et al., (2021)**, who Performed a study at Babylon, Iraq which labelled "assessment of student's habits toward obesity at primary schools in al-hilla city –iraq" and reported that majority had residence urban area.

Concerning child gender, the current study represented less than half had male gender more than half had female gender. And, this study accepted with Kurniawan et al., (2022), who conducted a study at Jakarta ,Indonesia which entitled "effectiveness of school-based obesity prevention program among elementary school children in jakarta" and showed that more than half were female gender, less than half were male gender. This finding was inconsistent with **Aktaş et al ., (2023)**,who carried out a study at İstanbul, Türkiye. Which entitled "obesity awareness among elementary school students: a controlled before – after study" and announced that less than half had female gender and more than half had male gender.

Regarding education and job of parents, the current study represented that almost all of father job were worker ,the majority of mothers were housewives, less than half had intermediate education of mother and father respectively. These findings supported by **Aljassim &Jradi (2021),** who carried out study at Riyadh, Saudi Arabia which entitled "childhood overweight and obesity among the saudi population: a case-control study among school children" and announced that, less than the minority of education father were middle school, more than one third were middle school of education mothers, less than two thirds of them were house wife and more than three quarter of father job were worker. Conversely, this finding was contradict with **Hamad et al., (2021)** who reported that more than half had intermediate

level related education of fathers. The researcher point of view about the majority of mother were housewives and less than half had intermediate education , this may due to more than half had residence rural area and not complete their education.

Part (II) :Family and health history of the studied children.

Concerning body mass index of students, the current study reported that, more than two thirds of the studied had normal body mass index. This study was similar to **Ray et al., (2023)**, who showed that, more than half were normal body mass index. While, this finding was disagreed with **Ozkan et al ., (2023)** , who conducted study at Van City, Türkiye which entitled "investigation of obesity awareness and physical activity levels of primary school students (van city example)" and announced that less than half of studied children were normal body mass index. The researcher point of view regarding body mass index of student are more than two thirds of children had normal body mass index due to BMI " body weight divided by height squared and more than two thirds students weight ranged from15 ≤25 kg and the majority height ranged from 110≤130 cm.

The current study revealed that reveals that more than two thirds of the studied children their height ranged from 110≤130 cm, the mean SD of children's height was 122.71±8.90 cm. Moreover, the majority of the studied children their weight ranged from15 ≤25 kg, the mean SD of children's weight was 23.56±6.57 kg. This study was dissimilar to **salman et al.,(2022)**, who conducted study at Türkiye which entitled "comparison of body composition and body mass index in the determination of obesity in school children " and explained that, the mean SD of children's weight was 23.8 ± 8.4 kg and the mean SD of children's height was 121.2 cm .On the other hand, this current study disagreed with **Abduelkarem et al., (2020)** and presented that, had a mean height of 131 cm (SD = ±11.1) and a mean weight of 30.5 kg (SD = ±10.8).

Part (III): Assessment of children' knowledge about obesity.

Regarding definition of obesity and symptoms of obesity, the current study revealed that, more than half of the studied children had correct knowledge regarding definition of obesity and symptoms of obesity respectively . This result was similar to **Aktaş et al ., (2023)** and reported that more than three quarters had correct answer about meaning of obesity. Additionally, this result was equivalent to **Gunagi et al ., (2020)** who executed a study at Belagavi city, North Karnataka which entitled "Assessment of knowledge of risk factors and prevention of obesity among school children: a cross sectional study" and reported that, less than three quarters had heard correct answer about obesity. Conversely, this study disagree with **Abdel Hakeem et al., (2022)** The results revealed that more than two-thirds of the students had inadequate knowledge about the definition of obesity, and majority of them also demonstrated a lack of understanding regarding the symptoms of obesity.The researcher point of view regarding more than half of the studied children had correct knowledge regarding definition of obesity and symptoms of obesity respectively due to spread social media, health services and curriculum become way for description health problem related health of children.

Concerning causes of obesity. the current study revealed that, more than half of the studied had incorrect knowledge regarding causes of obesity. This finding contradict with **Musa et al.,(2024)** who carried out a study at Katsina State, Nigeria which entitled "awareness of causes, consequences and preventive measures of overweight and obesity in children's health learning behavior in katsina state" and reported that, more than half had yes answer regarding causes of obesity.

Concerning children's knowledge regarding risk factors of obesity, the current study illustrated that, more than half of the studied children had incorrect knowledge regarding habits of eating that lead to overweight and obesity and food or fluid is a risk for overweight/obesity respectively . Adding to, less than two thirds had incorrect knowledge regarding factors that increase the

incidence of obesity. In accordance with, this study in consistent with **Kundu A et al.,(2021)** who Performed a study named "effectiveness of educational interventions to improve knowledge related to obesity among school going adolescents in selected schools of eastern india" and reported that, more than half had incorrect knowledge regarding risk factor of obesity as over eating. Additionally, this current study agree with **Abduelkarem et al.,(2020)** and revealed that ,over half of the participants lacked accurate knowledge about the risk factor associated with consuming foods high in both carbohydrates and fats. Additionally, the majority of participants demonstrated a lack of understanding regarding the risk factor of consuming foods prepared using methods such as boiling, frying, or grilling. and presented that, slightly more than half had incorrect knowledge regarding risk factor as consume food of mixed nature (carbohydrates and fats) and the majority reported incorrect knowledge regarding risk factor as consume food that was prepared by boiling and frying or grilling.

While, this current study dissimilar to **Kaur, D., et al.,(2023)** who conducted a study at Patiala city, Punjab, India which entitled "effect of educational intervention on improvement in obesity related knowledge and awareness among school going adolescents: Questionnaire Study" and reported that, more than half had correct knowledge regarding risk factor of obesity as Ghee/Oil products. According to the researcher, a significant proportion - nearly three-quarters - of the children in the study demonstrated an inadequate understanding of the risk factors contributing to obesity. due to spread fast food, junk food ,social media, video games, technology and electronic device become motivator to consumption foods lead to obesity.

Concerning children's knowledge about complication of obesity, the current study showed that, about two thirds and about three quarter of the studied children had incorrect knowledge regarding physiological and psychological complications of obesity, respectively. This result was similar to **Musa et al.,(2024)** and reported that, more than half had no answer regarding the consequences and complication of overweight and obesity on children's health. Meanwhile , this result was dissimilar to **Kundu A et al., (2021)** and reported that, about less than nearly one quarter and less than half had correct answer that hypertension and diabetes mellitus as complication of obesity respectively. The researcher point of view regarding complication of obesity showed that, less than two thirds and less than three quarter of the studied children had incorrect knowledge regarding physiological and psychological complications of obesity, respectively due to awareness and perception of school age children due to their young age not mature enough consequences and complication of obesity.

Concerning children's knowledge about prevention of obesity, more than half of the studied children had incorrect knowledge regarding ways of prevention of obesity related to healthy eating habits and food, more than two thirds and less than two thirds of them had incorrect knowledge regarding ways of prevention of obesity related physical activity or exercise and way of prevention during school day related children's habits for avoid obesity, respectively. This result agree with **Abdel Hakeem et al .,(2022)** and presented that, more than two thirds incorrect knowledge regarding obesity prevention. Additional to, This result was similar to **Musa et al., (2024)** and reported that, less than two thirds had no answer regarding knowledge of preventive measures to reduce overweight and obesity in children. While , this study disagreed with **Hamedo et al ., (2021)**, who conducted a study a study at Benha City, Egypt which entitled "evidence based obesity prevention program among primary school students according to 100 million health initiative" and showed that, less than half had incorrect complete answer regarding obesity prevention. The researcher point of view, regarding prevention of obesity showed that, majority had unsatisfactory knowledge regarding obesity prevention due to lack of health services , lack of awareness of children, lack of control related junk food and effect of social media on selection foods.

Regarding children knowledge about management of obesity, more than half of the studied children had incorrect knowledge regarding the importance of physical activity and more than two thirds of them had incorrect knowledge regarding the ways that can help in loss of excess weight. And, this study agreed with **Gunagi et al ., (2020)** and stated that more than three quarter had incorrect knowledge regarding management of obesity as adequate intake of fruits & vegetables. While, this result disagree by **Kundu et al., (2021)** and reported that, more than half had correct knowledge regarding management of obesity as regular physical activity.

Regarding total knowledge of school children, the current study relieved that the majority of student had unsatisfactory total knowledge regarding obesity prevention. Also, this study similar to **Hamido et al ., (2021)** and showed that less than two thirds of studied children had poor total knowledge regarding obesity preprogram implementation. On the other hand. This findings disagreed with **Wahab et al., (2024)** who conducted a study at titled El-Wady El- Geded Government, Southwestern Egypt "misconception of preparatory school girls regarding overweight and obesity at wady el- geded government" Showed that, more than half had studied subjects had average total knowledge. The researcher point of view, regarding that the majority of student had unsatisfactory total knowledge regarding obesity prevention due to lack of health educational seminars in school regarding obesity prevention.

Part (IV): Assessment of children' attitude regarding obesity prevention.

Regarding attitude of school age children regarding obesity prevention, presented that, more than half of them neutral attitude that, Obese children feel psychologically unstable and avoiding excessive use of social media reducing the risk of obesity, respectively. In addition to, this study similar to **Hamido et al.,(2021)** showed that more than half had neutral attitude that is important to avoid excessive using of social media to prevent obesity and less than two thirds had neutral attitude that obesity causes psychological problems like depression.

Concerning total attitude of children. This study found that, less than two thirds negative attitude and more than one third positive attitude regarding obesity prevention. This result was agreed with **Hamido et al ., (2021)** showed that, less than three quarter had negative attitude preprogram implementation. While, the current study contradict with **Swain &Kathuria(2020)** who carried out a study at Rourkela, Odisha which entitled "A study to assess the prevalence of obesity and evaluate the effectiveness of structured teaching program on knowledge regarding prevention and control of obesity in a selected school of Odisha" and reported that, more than two thirds of subjects had positive attitude preprogram.

Part (Relations between demographic characteristics, and health history of the studied children and total knowledge, total attitude regarding obesity.

Regarding relations between demographic characteristics and health history of the studied children and total knowledge illustrated that, there was highly statistically significant relation between total children's knowledge and their demographic characteristics as age. This findings agreed with **Wahab, et al., (2024)** and Showed that, there is highly statistically significant relation between the studied subjects' total knowledge regarding overweight and obesity and age of studied sample.

Concerning relation between demographic characteristics of the studied children and their total attitude regarding obesity prevention explained that, there was highly statistically significant relation between total children's attitude and their demographic characteristics as age . This findings agreed with **Wahab et al., (2024)** and demonstrates that, there is highly statistically significant relation between the studied subjects' total attitude toward overweight and obesity and age of studied sample .The researcher view of point showed that there was highly statistically significant relation between total children's attitude and

their demographic characteristics as age due to level of attitude related level of age , which maturation of age, adherence with healthy life style, positive back ground regarding health and consequences affect level of attitude.

The analysis of the relationship between the health history of the studied children and their attitudes towards obesity prevention revealed a highly statistically significant correlation between the children's total attitude and their Body Mass Index (BMI). This finding is consistent with the results of **Oyewande et al. (2019)**, who also reported a highly significant association between BMI and attitude

Regarding relation between health history of the studied children and their total attitude regarding obesity prevention illustrated that, there was highly statistically significant relation between total children's attitude with their body mass index. Additionally, this result was similar to **Oyewande et al ., (2019)** and found that, there was a highly significant association between body mass index with attitude.

CONCLUSION

Based on findings of the present study, it can be concluded that the majority of study sample had unsatisfactory total level of knowledge and less than two thirds had negative attitude regarding obesity prevention.

There was highly statistically significant relation between total children's knowledge and their socio demographic characteristics as age.

There was highly statistically significance between total total children's attitude and socio demographic characteristics as age school children.

There was statistically significant relation between total children's attitude with their body mass index.

There was highly statistically significant relation between total children's knowledge and their total attitude regarding obesity prevention

RECOMMENDATIONS

Based on the findings, the following recommendations are suggested:

Distributing brochures on obesity prevention in schools and universities.

Conducting regular educational and training programs to enhance students' knowledge and attitudes toward obesity prevention.

Implementing comprehensive programs that promote healthy eating habits among children and adolescents while reducing the consumption of unhealthy foods and sugary beverages, with a stronger focus on interventions targeting young individuals.

Encouraging parents to support their children's healthy growth by fostering good habits, providing guidance on a nutritious diet, ensuring sufficient sleep, and promoting physical activity from an early age.

Governments should develop and enforce strategies that promote active lifestyles among school-aged children and adolescents. These should include creating healthy school environments, improving nutrition and health education, and establishing multifaceted weight management programs for overweight and obese children and teenagers.

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