Risk Factors Associated with Overweight among Primary School Children

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Abstract

Overweight is a serious health problem among primary school children which is a risk factor for several health consequences**. Aim:** The aim of this study was to assess risk factors associated with overweight among primary school children**. Design:** Descriptive design was used to conduct this study**. Setting:** The study was conducted at 64 urban primary schools of educational directorate of Shubra Al-Kheima city. **Sample:** A purposive sample of 240 overweight primary school children was selected. **Tools:** Two tools were used for data collection, first tool structured interviewing questionnaire divided into five parts, socio-demographic characteristics of children**,** children health problems related overweight, student nutritional health history, children knowledge regarding overweight, and lifestyle factors associated with overweight among primary school children, second tool was school student files. **Results:** 60.8% of studied students had family history for overweight, 85.4% of studied students had unsatisfactory knowledge and 93.3% of studied students had unhealthy lifestyle associated with overweight. **Conclusion:** Our study showed that 12.5% of studied students weren't health problems related to overweight, 73.3% of studied students were bad dietary habits, and 93.3% of studied students had unhealthy lifestyle, not statistically significance relation between knowledge about overweight and dietary habits, highly statistical significance relation between dietary habits and overweight among primary school children. **Recommendation:** Health education program to raise awareness of children toward health hazards and its consequences of overweight.

Keywords: Risk factor, overweight, primary school children.

Introduction

Overweight are serious health concerns for many children and could be associated with low physical-fitness levels. Childhood overweight have been considered by the World Health Organization (WHO) as a serious public health challenge, especially in low- and middle-income countries, Overweight in schoolchildren could be related to multiple causes, such as the modern lifestyle characterized by inactivity and passive overeating over past years ***(Abdelkarim et al., 2020).***

Overweight is a form of malnutrition that often results from an imbalance between food intake and energy utilization. Overweight and obesity in children and adolescents are considered global epidemic. Recent statistics show that, 16% of children, 6 - 11 years old, are overweight. In actual numbers, the estimate suggested that 150 - 160 million school-age children worldwide were overweight, of which, 35 - 40 million were obese. Statistics also show that, prevalence of overweight continues to increase during the school age and adolescent stages ***(Hadhood et al., 2017).***

Childhood Overweight is determined by the child's height and weight to calculate body mass index (BMI), which is adjusted according to norms based on the child's age and gender. BMI between the 85th and 94th percentile is in the "overweight" range, At the most basic level, childhood overweight emerges from consuming more calories than expended, resulting in excess weight gain and an excess body fat. Caloric imbalance is the result of, and can be further

exacerbated by, a range of obesogenic behaviors. That is, behaviors that are highly correlated with excess weight gain ***(Smith & Kobayashi, 2020).***

Overweight are serious epidemic issues worldwide in general and in Middle East countries especially due to multiple risk factors like sedentary life style activity, eating behavior and high calories food intake mainly carbohydrate. The progression of childhood obesity into adulthood is associated with development of significant morbidity including type 2 diabetes (T2D) and cardiovascular diseases, suggesting that the pathogenic process begins during childhood ***(Nofal et al., 2019).***

Direct risk factors for childhood overweight are low physical activity, excess calorie intake, and the imbalance between the two in rapidly transitioning African settings, the sustainable development goal (SDG) target for obesity for 2030 is to reduce by one-third premature mortality from non-communicable diseases (NCDs) through prevention and treatment. The SDG indicator tracks the share of a country's population that is overweight or obese, especially in children who often carry obesity into adulthood ***(Kambondo & Sartorius, 2018).***

The consequences of overweight on the health outcomes of children educational, policy- and practice- based intervention required must reach across all regions, cultures, healthcare coverage systems, and socio-economical levels to reach those individuals with the greatest needs. Further, the stakeholders in reducing childhood overweight include not only children, but also parents; caregivers; schools; early care and education providers; healthcare professionals; community and business leaders; state and local officials and society, as a whole. Educational needs include improving awareness of nutritional guidelines and needs, providing tools and resources, attempting to facilitate healthier behavior, as well as ensuring access to healthy foods ***(Williams & Greene, 2018).***

Overweight in childhood are known to have significant impact on both physical and psychological health, overweight children are likely to stay obese into adulthood and more likely to develop diseases like diabetes, hypertension, infertility and cardiovascular diseases at a younger age. It is emerging convincingly that the genesis of type 2 diabetes and coronary heart disease begins in childhood, with childhood overweight serving as an important factor. Genetic factors influence the susceptibility of a given child to an overweight - conducive environment; however, environmental factors, lifestyle preferences, and cultural environment seem to play major roles in the rising prevalence of overweight worldwide ***(Saleh et al., 2020).***

Significance of study

Childhood overweight has become a major public health concern globally because of its adverse health consequences and escalating prevalence. The factors underlying the disease conditions manifested during adulthood commonly originate in childhood ***(Karki et al., 2019).***

Overweight in children are considered global epidemic. Recent statistics show that, 16% of children, 6 - 11 years old, are overweight. In actual numbers, the estimate suggested that 150 - 160 million school-age children worldwide were overweight, of which, 35 - 40 million were obese. Statistics also show that, prevalence of overweight continues to increase during the school age and adolescent stages, the rapid increase in prevalence of overweight signals that development of strategies to face such problem is a health priority ***(Hadhood et al., 2017).***

Overweight affect self-esteem of children and impair social development, overweight is a condition characterized by abnormal fat accumulation in adipose tissue that results in an excess of body weight and significant impairment of health ***(Alhadi, 2019).***

Aim of the Study

This study aiming to assess the risk factors associated with overweight among primary school children through:

1. Assessing dietary habits among primary school children.
2. Assessing primary school children lifestyle.
3. Assessing primary school children knowledge related to overweight.
4. Assessing health problems related to overweight among primary school children.

Research question

The current study answered the following question:

1. What are the risk factors related to overweight among primary school children?
2. What are health problem associated with overweight among primary school children?
3. Is there a relation between knowledge about overweight and dietary habits among primary school children?
4. Is there a relation between dietary habits and overweight among primary school children?

Subjects and Methods

I-Technical design
II- Operational design
III- Administrative design
IV- Statistical design

I-Technical Design:

Research design:

Descriptive research design was utilize in this study.

Setting:

The study was conducted at 64 urban primary schools of educational directorate of Shubra Al-Kheima city.

- The study was conducted at Shubra Al-Kheima educational directorate, because it is the highest density for number of primary schools students, which include: (192) urban primary schools.

Sampling:

A purposive sample of 240 overweight primary school children was selected, selected from 192 urban primary school according to the following criteria: both gender, six grade, BMI overweight (≥85 percentile to <95), ≥ 25.0 kg/m^2 - < 30.0 kg/m^2.

Tools of data collection.

Tow tools were used for data collection:

The first tool:

Structured interviewing questionnaire designed by the investigator and written in simple Arabic language to gather data include five parts:

Part I: Socio demographic characteristics for children and their parents it included16 closed ended questions from Q1to Q16.

Part II: student health history of overweight among primary school children, this tool was adopted from ***Olsztyn, (2017)*** included the following:

A- Dietary habits: (eat three meals daily; eat breakfast daily, etc...).

❖ **Scoring system:**

- **Good** habits more than 24 (≥50%)
- **Bad** habit less than 24 (<50%)

B- Food frequently consumption: (Carbohydrate, animal protein, vegetable protein, vegetables, fruits, Water, drinks and Sugars).

❖ **Scoring system:**

- **Healthy** food consumption (≥50%)
- **Unhealthy** food consumption (<50%)

C- Nutritional beliefs: (Eating cereals (beans, beans, and lentils) is sufficient once per day**,** milk consumed by children and adolescents only*, etc…)*.

❖ **Scoring system:**

Children reported nutritional beliefs was scored (3) for the "agree" beliefs, scored (2) for the "not sure" beliefs, and (1) for the "disagree" beliefs. The total score was divided into **(Satisfactory)** which represented more than 50% of the total nutritional beliefs, and **(Unsatisfactory)** which represented less than

50% of the total nutritional beliefs

Part III: Children health problems related overweight as:

- Physical problems: (Fatigue, Immobility and Diabetes).
- Psychological problems: (Lower self-esteem, Low self-confidence, etc…).
- Social problems: (Worry attending in public places, Exposed to mocking from colleagues, etc…).

❖ **Scoring system:**

For the student's health problems: Total health problems score level further divided into the following:

1. **Physical problem:**
   - If answers is equal to or more than (6) then there is a physical problem
   - If answers is less than (6), and then there is no physical problem
2. **Psychological problem:**
   - If answers is equal to or more than (2) then there is a psychological problem
   - If answers is less than (2), and then there is no psychological problem
3. **Social problem:**
   - If answers is equal to or more than (3) then there is a social problem
   - If answers is less than (3), and then there is no social problem

Part IV: Assessing children knowledge regarding overweight, it included 9 closed ended questions from Q1 to Q9 (concept of overweight, weight classification, body mass index, causes of overweight among school children, risk factors of overweight, physical health consequence of overweight, psychological health consequence of overweight, social health consequence of overweight, prevention of overweight).

❖ **Scoring system:**

- **Satisfactory** (≥50%)
- **Unsatisfactory** (<50%)

Part V: Assessing lifestyle factors associated with overweight among primary school children adopted from ***Samuel (2019)*** as:

- **Sedentary lifestyle:** (Watch TV, hours a day do you spend watching TV, use the computer (internet), play video games, how many hours per day do you spend using the computer, How many hours per day do you spend using video games, interested in reading / doing homework, listen to music) it included 8 closed ended questions from Q1 to Q8.

❖ **Scoring system:**

- **Healthy** less than 4 (<50%)
- **Unhealthy** more than 4 (≥50%)

- **Physical and motor activities:** (Membership at sporting club, helping in housework activities, jumping on a rope, practice hide and seek or dance, play football, handball, Running, Tennis, exercise cycling, play on the school playground, walk to school, use the bike to go to school, use a means of transportation to go to school) and it included 13closed ended questions from Q1 to Q13.

❖ **Scoring system:**

- **Healthy** more than 7 (≥50%)
- **Unhealthy** less than 7 (<50%)

- **Sleeping pattern:** (Sleeping hours daily, Weekend sleeping hours) and it included 2 closed ended questions from Q1 to Q2.

❖ **Scoring system:**

- **Healthy** less than 3 (<50%)
- **Unhealthy** more than 3 (≥50%)

The second tool:

The second tool was school students files to obtain weight, height and calculated BMI According to ***(Hamed, 2019)*** (BMI) is estimated by dividing the weight in kg on square of height in meter.

❖ **Scoring system:**

- Overweight > 25 kg/m2
- Obese > 30 kg/m2

Content validity:

Face and content, validity of the study tools were ascertained by five experts from

community health nursing department of faculty of nursing, Ain-shams University to check content validity, relevance and comprehensiveness.

Reliability:

The reliability of the tool was assessed through measuring their internal consistency by Cronbach Alpha Coefficient test and its value was (0.127): (0.24) for health problems, (0.16) for dietary habits, (0.40) food frequency consumption, (0.16) nutritional health belief, (0.9) knowledge, (0.22) life style.

II- Operational design:

The operational design for this study consisted of three phases included: preparatory phase, pilot study and field work.

A) The preparatory phase:

The investigator reviewed current, past, local and international related literature with various aspects of the study using articles, internet periodicals, and magazines. This was necessary for the investigator to get aquatinted with, and oriented about aspects of the research problem, as well as to assist in development of data collection tools.

B) Pilot study:

A pilot study was carried out on 12 primary school children to test applicability and clarity of the tools, assessment of feasibility of fieldwork, identification of a suitable place for interviewing primary school children, and to detect any possible obstacles that might face the investigator and interfere with data collection. A necessary modification was done according to the results of pilot study. The sample of the pilot study was excluded from the total study sample.

C) Field work:

Approvals was obtained from the research and ethics committee at faculty of nursing Ain-shams University, also an official permission was sent to Shubra Al-Kheima educational districts to conduct the study.

The actual fieldwork of this study was carried out by investigator was completed the tool by interview the students during 3 days weekly to each school to complete tools of data collection.

The investigator was visited each school on (Monday, Tuesday and Wednesday) of each week during the morning from the 9:30 AM to 2 PM by rotation, and took time for each student of 30:45 minutes. It took about four months from the beginning of November 2019 to March 12/3/2020 at Shubra Al-Kheima educational districts.

The investigator introduced her firstly to students and explained the purpose of the study before each interview.

Each student is interviewed individually after the oral approval for participation in the study according ethical issues.

The investigator role in completing the questionnaire was to facilitate the understanding of any confusing or difficult question for the student.

III- Administrative design:

An approval was obtained from the research and ethical committee at faculty of nursing - Ain Shams University also an official permission was sent to the Shubra-Al-Kheima educational districts to facilitate the conduction of the study, was submitted for administrators of previously mentioned setting, concerned the title objective, study technique and tools seeking for their co-operation total confidentiality of any obtained information was ensured.

Ethical considerations:

Verbal approval was obtained from the studied student before inclusion in the study, the student was had the right to accept or refuse participation at any time, ensuring that privacy and confidentiality of all data and personal information was used only for research purpose. The research approval was obtained from ethical committee before starting study.

IV- Statistical design

The collected data were collected and encoded in special format to be suitable for computer feeding. Following data entry, checking and verification process were carried out in order to avoid any errors. Data were analyzed using the statistical package for social science SPSS. The following statistical analysis measures were used.

- **Descriptive statistical measures,** which include number, percentages, and averages (Minimum, Maximum, Arithmetic mean (X), Statistical deviation (SD).

Statistical analysis tests, which include Chi square, T test.

Results:

Table (1): Shows that 90.8% of students their ages ranged between 11-12 years old, 41.3% of students were males and 52.9% were the first child between their brothers. 9.6% of students residing rural area, 87.9% of students take daily expenses, 68.8% of students spend their expenses for buying food. As regarding family history for overweight 60.8% of students their family were obese and 53.4% of (146) students their kin relation of obese person were fathers.

Table (2): Shows that 61.3% of students sometimes eat three meals daily, 47.5% of them sometimes eat breakfast daily, 47% of students sometimes eat meals at regular times, 61.7% of students sometimes eat snacks between meals, and 52.4% of them sometimes eating fast food during the day, 58.8% of students never add sugar to their drinks. 41.7% of students always eat in front of the TV.

Figure (1): Shows that 85.4% of students had unsatisfactory knowledge about overweight; meanwhile only 14.6% of them had satisfactory knowledge about overweight.

Table (3): Shows that 91.7% of students were unhealthy watching TV. 60.5% of them were unhealthy hours a day spending in watching TV. The table also clarifies 70.8% of them were unhealthy using a computer (internet), meanwhile 54.6% of students were healthy playing video games. 62.9% from 170 students were unhealthy hours a day spending in using computers. Meanwhile 88% from 109 students were unhealthy hours a day spending in using video games.

Table (4): Illustrates that there was **no statistical significance difference** between total Knowledge of the studied students and their dietary habits p-value ≥ 0.05**,** there was **no** statistical **significance difference** between total Knowledge of the studied students and their health belief p-value ≥ 0.05**.**

Table (5): Shows that there was **highly statistical significance difference** between body mass index of the studied students and their dietary habits p-value ≤ 0.001, there was **highly** statistical **significance difference** between body mass index of the studied students and their unhealthy consumption p-value ≤ 0.001 and there was **no statistical significance difference** between body mass index of the studied students and their health belief p-value ≥ 0.05**.**

Table (6): Shows that there was **not statistically significance difference** between body mass index of the studied students and their physical, psychological and social problems p-value ≥ 0.05, there was a **statistical significance difference** between body mass index of the studied students and their Psychological problems p-value ≤ 0.05 and there was **no statistical significance difference** between body mass index of the studied students and their Social problem p-value ≤ 0.05.

The results of this study will be portrayed into the following:

Table (1): Distribution of the studied primary school children's according to their Socio-demographic characteristics (n=240).

Items	No	%
Age:		
11-12	218	90.8
13-14	22	9.2
Mean and SD: 11.80 ± 0.61		
Gender:		
Male	99	41.2
Female	141	58.8
Birth order:		
First	127	52.9
Second	69	28.8
Third	41	17
Fourth	3	1.3
Place of residence:		
Urban	217	90.4
Rural	23	9.6
Pocket money:		
Yes	211	87.9
Sometimes	27	11.3
Never	2	0.8
Spend pocket money (n=238)		
Buying food	165	69.3
Buying school supplies	45	18.9
Saving money	28	11.8
Family history for overweight or obesity:		
Yes	146	60.8
No	94	39.2
Kin relationship of obese person (n=146)		
Father	78	53.4
Mother	61	41.8
Uncle	7	4.8

Table (2): Distribution of the Studied Primary School Children according to Their Dietary Habits (n= 240).

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
Eat three meals daily	50	20.8	147	61.3	43	17.9
Eat breakfast daily	80	33.3	114	47.5	46	19.2
Take sandwiches with you to school	132	55.0	73	30.4	35	14.6
Eating food from street vendors	54	22.5	98	40.8	88	36.7
Eat meals at regular times	46	19.2	113	47	81	33.8
Eat snacks between meals	42	17.5	148	61.7	50	20.8
Sleep at least two hours after eating dinner	69	28.8	113	47	58	24.2
Eating processed meats in your meals	52	21.7	120	50.0	68	28.3
Eating fast food during the day	39	16.3	126	52.4	75	31.3
Drink soft drinks during the day	36	15.0	105	43.7	99	41.3
Eat crispy chips during the day	30	12.5	116	48.3	94	39.2
Add sugar to drinks	19	7.9	80	33.3	141	58.8
Eat in front of the TV	100	41.7	86	35.8	54	22.5
Drinking water during meals	50	20.8	120	50.0	70	29.2
Eat fruits before meals	49	20.4	98	40.8	93	38.8
Eat vegetables before meals	46	19.2	92	38.3	102	42.5
Total dietary habits	8	3.3	211	87.9	21	8.8

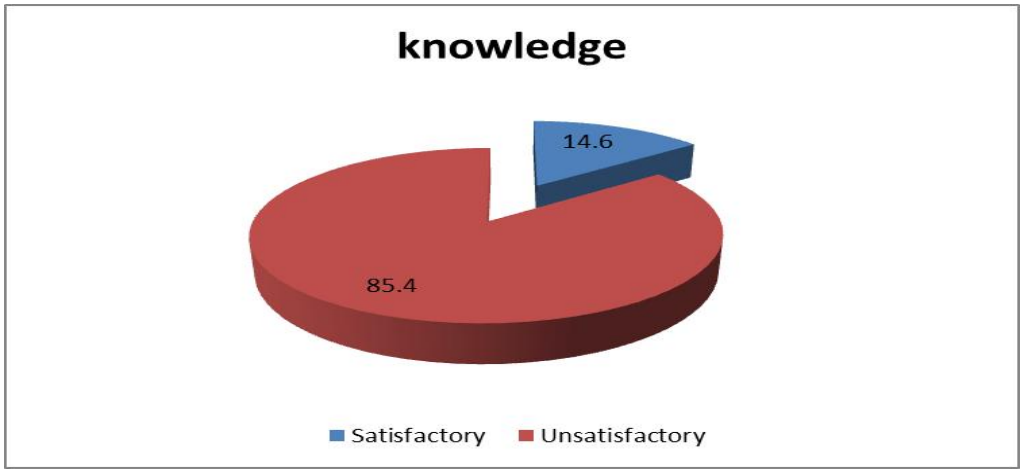

Figure (1): Distribution of the studied Primary School Children according to their Total Knowledge regarding Overweight (n= 240).

Table (3): Distribution of the Studied Primary School Children according to their Sedentary Lifestyle (fixed activities) (n=240).

Sedentary lifestyle	Yes		No	
	No	%	No	%
Watch TV				
Yes				
No	20	8.3	220	91.7
Hours a day of watching TV (n= 220)	87	39.5	133	60.5
Using a computer (internet)				
Yes				
No	70	29.2	170	70.8
Play video games				
Yes				
No	131	54.6	109	45.4
Hours a day of using computers (n= 170)	63	37.1	107	62.9
Hours a day of using video games (n= 109)	13	11.9	96	88.0
Reading / performing homework				
Yes				
No	57	23.8	183	76.3
Listen to music				
Yes				
No	57	23.8	183	76.3

According to research question (no: 3): Is there a relation between Knowledge about overweight and dietary habits among primary school children?

Table (4): Relation between Knowledge of the studied students and their dietary habits, food consumption and health belief (n=240).

Items	Knowledge				X^2	P value
	Unsatisfactory (n=205)		Satisfactory (n=35)			
	No	%	No	%		
Dietary habits						
Bad habits	151	62.9	25	10.4	0.076	0.463
Good habits	54	22.5	10	4.2		
Healthy consumption						
Low	179	74.5	31	12.9	0.043	0.547
Medium	26	10.8	4	1.7		
Un healthy consumption						
Medium	17	7.1	2	0.8	0.273	0.455
High	188	78.3	33	13.8		
Health belief						
Insufficient	114	47.5	16	6.7	1.836	0.399
Sufficient	81	33.8	18	7.5		
Good	10	4.2	1	0.4		

**Highly significant difference p ≤ 0.001 *statistically significant difference p≤ 0.05
No Statistically significant difference p≥ 0.05

According to research question (no: 4): Is there a relation between dietary habits and overweight among primary school children?

Table (5): Correlation between body mass index, Dietary habits, Healthy consumption, unhealthy consumption and Health belief (n=240).

Items	BMI	
	r	P value
Dietary habits	0.522	0.000**
Healthy consumption	0.068	0.291
Unhealthy consumption	0.305	0.000**
Health belief	0.049	0.453

**Highly significant difference p ≤ 0.001 *statistically significant difference p≤ 0.05
No Statistically significant difference p≥ 0.05.

Table (6): Correlation among body mass index and health problems (n=240).

Items	BMI	
	r	P value
Physical problem	0.057	0.376
Psychological problems	.130	0.044*
Social problem	0.065	0.316

*Statistically significant difference p ≤ 0.05 No Statistically significant difference p ≥ 0.05

Discussion

Egypt is one of the developing countries that face a serious health problem regarding overweight. Egypt has been ranked as a country with the highest rate of overweight worldwide with a percentage exceeds 35%; (19%) of the entire population. Overweight and obesity in adults may partially originate from the childhood and adolescents as obese children are around five times more likely to be obese in adulthood than those who were not obese ***(Kamel et al., 2020).***

The current study aimed to assess the risk factors associated with overweight among school children**.**

Part I: Socio- demographic characteristics of the studied primary school children's

The result of the current study showed that majority of studied children there age was 11-12 years, and mean age was 11.80±0.6 years **(Table 1).** This result was in agreement with the study carried out by ***Hamed et al. (2019)*** who assessed prevalence of obesity and overweight among primary children in Qena, Egypt, he reported that the age distribution of in the age of primary schools ranged from 6-11 years.

Regarding to family history for overweight or obesity, the current study showed that less than two third had family history for overweight **(Table 1)**. The present study findings were in disagreement with the study carried out by ***Abduelkarem et al. (2020)*** who assessed Obesity and its associated risk factors among school-aged children in Sharjah, UAE, and found that 80.2 % of studied children weren't family history for overweight or obesity.

In the opinion of the investigator, regarding the family history of overweight and obesity, these may increase among primary school children due to the environmental and genetic factors.

Part II: Primary School Children according to Their Dietary Habits

Regarding to eat three meals daily less than two third of studied students were sometimes eat three meals daily **(Table 2).** The present study findings were in agreement with the study carried out by ***AL-Qahtani (2018)*** who assessed prevalence of obesity and its relation with eating habits and lifestyle among male primary schoolchildren in Al-Madinah City, Saudi Arabia, reported that 59.7 % were eating three meals daily.

Regarding to eating snacks between meals less than two third of studied students were sometimes eating snacks between meals **(Table 2).** The present study findings were in agreement with the study carried out by ***AL-Qahtani (2018)*** who assessed Prevalence of Obesity and its Relation with Eating Habits and Lifestyle among Male Primary School children in Al-Madinah City, Saudi Arabia**,** reported that 88.1% of studied students were eating snacks between meals.

According to the investigator point of view, exposure to mocking from colleagues against overweight children can impair the quality of their life and contribute to unhealthy behaviors such as social isolation.

Part III: lifestyle factors associated with overweight among primary school children:

The present study revealed that near to third of studied students was unhealthy watching TV (**Table 3).** The present study findings were in agreement with the study carried out by ***Adeniyi et al. (2019)*** that assessed overweight and obesity among school-aged children and maternal preventive practices against Childhood Obesity in Select Local Government Areas of Lagos, Southwest, Nigeria and found that most of studied students were unhealthy watching TV.

From the investigator point of view, watching TV has several effects that may lead to overweight including decreased metabolic rate, and increased snacking while watching TV in addition to the influence of food advertisements. Moreover, it has been documented that increasing the time spent on watching TV will increase the prevalence of overweight.

The present study revealed that less than half of studied students were unhealthy playing video games (**Table 3).** The present study findings were in disagreement with the study carried out by ***Mekonnen et al. (2018)*** who that assessed Overweight/obesity among school aged

children in Bahir Dar City: Cross sectional study and found that 90.6% of studied students weren't playing Computer game\mobile game.

The present study revealed that more than four fifth of studied students were unhealthy sleeping hours daily **(Table 3).** The present study findings were in agreement with the study carried out by ***Hamed et al. (2019)*** who assessed Prevalence of Obesity and Overweight among Primary Schools Children in Qena, Egypt and found that 94.4% of studied students were daily sleeping hours >12 hours.

Part IV: Assessment Knowledge of Primary School Children's regarding Overweight:

The present study revealed that less than one fifth of studied students were satisfactory knowledge about overweight/obesity and more than three quarter students were unsatisfactory knowledge **(Figure 1).** The present study findings were in agreement with the study carried out by ***Adebimpe (2019)*** that assessed Prevalence and knowledge of risk factors of childhood obesity among school-going children in Osogbo, South Western Nigeria, and found that 24.4% of studied students were good knowledge and 75.6% of studied students were poor knowledge.

According to the investigator point of view, the most of students had unsatisfactory knowledge because them so young and need to increase knowledge about the hazards of overweight as a part of health education programs among primary school children.

Part V: Concerning statistical relation between study variables and research questions

(Table 4) replying on research question **(no: 3)** who stated that is there a relation between Knowledge about overweight and dietary habits among primary school children? This question was supported when the present study showed that, the relation between Knowledge about overweight and dietary habits was **no statistical significance difference** among primary school children. The previous findings are congruent with study carried by ***Alasmaria et al. (2017)*** who assessed Relationship between Body Mass Index and Obesity Awareness in School Students and stated that there was no statistical significance difference relation between Knowledge about overweight and dietary habits $p < 0.687$.

The current study revealed that there was **highly statistical significance difference** relation between dietary habits and overweight among primary school children (**Table 4)**. According to ***Nofal et al. (2020)*** who assessed Prevalence and Risk Factors of Overweight and Obesity among Primary School Children in Hawally District, State of Kuwait and stated that there was highly statistical significance difference relation between dietary habits and body mass index of studied children $p<0.001$** and there was a highly statistical significance difference between body mass index of the studied students and their unhealthy consumption p-value ≤ 0.001**.

From the investigator point of view, working parents especially mothers who work long hours may have limited time to prepare fresh nutritious meals and may depend more on processed foods for the family. Despite generally being the caretaker of the children, the mother lacks time to have a close look at their children's food consumption behavior, physical activity, and sedentary behaviors. Also, working mothers who can afford junk food for their children may cook fewer meals at home; hence children may prefer to choose more restaurant meals and fast foods that are densely packed with calories, and thus resulting in overweight.

Conclusion

After conduction of the present study, it concluded the following:

The present study showed that there were a majority of studied students their ages ranged between 11-12 years old, as regarding family history for overweight more than half of them their family were obese. The most of studied students weren't health problems related to overweight among primary school children. More than two third of them were bad dietary habits among primary school children. The most of studied students were unsatisfactory knowledge about overweight. Majority of them were unhealthy lifestyle associated with overweight. There was no statistical significance relation between knowledge about overweight and dietary habits among primary school children, finally highly statistical significance relation between dietary habits and overweight among primary school children.

Recommendations

In the light of these finding it was recommended that:

1. Health education program to raise awareness of school children toward health hazards and its consequences of overweight in urban primary school.
2. Curriclum of menitery of education that include information about healthy diet and implement of physical activity.
3. Activate the physical activity programs for promoting lifelong health and well-being of primary school children.

Further research about:

- Comparative study to assess risk factors associated with overweight among primary school children in rural and urban schools.

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