

Quality of Life of Obese School-Age Children and their Mothers' Perspectives in Cairo, Egypt

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Abstract

Background: Obesity is rapidly overtaking as a burden of the disease, it is expanding to include children, which put it on the top of the international public health agenda. **Aim** the study aimed to explore the quality of life among school-age children suffering from obesity and their mothers' perspective in the Cairo governorate. **Research design** was descriptive correlational cross-sectional design. **Setting:** The study was carried out in selected governmental primary schools in Cairo governorate. **Sample:** In total, two hundred children and their mothers agreed to participate in the study. **Tools:** Two tools were used, **I : Pre-designed Questionnaire interviewing** Format which consisted of three parts: **first part** focused on socio-demographic data for children such as age, gender, grade level, their parents' educational levels and family income of the studied sample. **Second part** focused on medical and family history. **Third part** focused on the nutritional habits of children. **II: Pediatric Quality of Life Inventory version 4.0** which consisted of two part, **first part:** Children health-related quality of life to assess QoL of children which includes 23-items covering the physical, emotional, social and school functioning domains. **Second part:** Mothers' perspective on the QoL of their children. **Results:** that the mean age of the participating school children was 9.37 ± 1.8 , 63.5% of the children were obese and 25% of them had obesity class III. 69.5% of children have a positive family history of obesity. An overview of the QoL dimensions, showing the weighted means for physical, social, emotional, and school dimensions (1.96 ± 0.43 ; 1.94 ± 0.51 ; 1.65 ± 0.39 ; 1.80 ± 0.43 respectively). These values indicate poor QoL. **Conclusion:** It was concluded that school-age children in the Cairo governorate had a poor QoL, with a statistically significant difference recorded with respect to age, BMI, and family income, and a highly statistically significant difference with the educational level of the mother of each child. However, no statistically significant difference was identified between QoL and gender. **Recommendation:** Establish education programs from school age onwards to teach families about healthy eating habits and raise awareness of health hazards associated with fast food consumption.

Key words: Reproductive health, Female, Adolescent.

Introduction

Obesity among school-age children has become the prevailing nutritional disease in the global context, posing a serious public

health problem because it considered a risk factor for many morbidity and mortality issues later in adulthood (Khairy, et al, 2016). The increased incidence of the disease in many developing countries has been particularly pronounced, placing significant and

worsening burdens on the medical, psychological, social and economic infrastructure of less prosperous nations (Ara, et al, 2012).

The prevalence of obesity among school-age children requires urgent investigation, especially given that the premature development of obesity comorbidities, previously considered adult diseases, such as type 2 diabetes and metabolic syndrome, is increasingly widespread among children (Rendón-Macías, et al, 2014).

Obesity among school-age children occurs due to caloric imbalance and is affected by various behavioral factors, including unhealthy eating habits and dietary patterns, sedentary lifestyles and a lack of physical activity. Dietary intake and physical activity can also be affected by environmental factors related to parents, peer, school, and community, all of which can influence their weight status (Riazi, et al, 2010). In some cases, it may occur as a result of genetic causes, such as leptin deficiency, medical causes, such as hypothyroidism and growth hormone deficiency, or as a result of the side effects of some drugs, such as steroids (Khairy, et al, 2016). Obesity among school-age children has also been linked to other problems, such as impaired psychological health (Ali, et al, 2016) or the limited development of peer relationships (Black., et al, 2014).

Health-related quality of life (HRQOL) is a comprehensive, multi-dimensional structure which includes self-assessment of physical, emotional, social, and school well-being (Liu., et al, 2016). The dimensions that are most strongly affected by childhood obesity are physical, social and school functioning (Ottova, et al, 2012; Chan, 2013 Buttitta, et al, 2014;). However, some studies indicate that emotional functioning is also significantly affected (Farahani, et al, 2015).

Obesity has well documented adverse physical health consequences in both childhood and adulthood (Liu., et al, 2016). There is also mounting evidence that obesity among school-age children and adolescence can have a damaging effect on HRQOL (Bolton., et al, 2014; Morrison ., et al, 2015; Zeller., et al, 2015; Pratt., et al, 2016). Childhood obesity tends to persist until adulthood and thus potentially represents the beginning of a lifetime chronic process leading to different patterns and magnitudes of impairment in relation to the health-related quality of life (Khairy., et al, 2016).

The measures of HRQOL are used to assess key aspects of health that are often not detected or evaluated by more traditional physiological and clinical measurements. These characteristics can include physical symptoms, social interactions, emotional wellbeing, and the effect of a health condition on daily activities (Khairy., et al, 2016). A key group of professionals who are positioned to effectively assess and address quality of life in school-age children are school nurses (Powell., 2016). The National Association of School Nurses asserts that school nurses have the knowledge and experience to promote the prevention of obesity and address the needs of obese children in schools. A school nurse also collaborate with students, families, school personnel, and health care providers in the promotion of healthy weight and to identify overweight and obese children who may be at risk for emergent health problems. A school nurse can refer to and follow-up with students who may need to see a health care provider, as well as educate and advocate for changes at both school and district level in order to promote a healthy lifestyle for all students (NSNA, 2013).

Given the proven difficulty of curing obesity, prevention could be a crucial strategy in the control of this epidemic. To date, the majority of approaches have focused on changing the behavior of individuals towards

diet and exercise. However, successful approaches to reduce obesity need to take into account the social and cultural context in which this health condition occurs (Ismail, et al, 2011).

Significance of the study:

The twenty-first century has seen the issue of excessive weight in children. As it becomes a major health challenge, with global figures suggesting that as many as 42 million children are obese or overweight in countries around the world (WHO, 2013). The increased prevalence of this chronic condition in school-age children and adolescents in recent years has been especially pronounced in low and low middle-income countries (WHO, 2013) although wealthy countries are not exempt, with 31.8% of children in the United States being affected (Ogden., et al, 2016), particularly in low income households (Levine., 2011). Irrespective of context, childhood obesity is a multifactorial problem that can have an array of adverse effects upon the lives of young people, including upon the physical, emotional, and social aspects of their lives (Ahuja., et al, 2014).

In order to design successful intervention strategies to manage childhood obesity, it is first necessary to understand how school-age children perceive obesity and its consequences (Rendón-Macías., et al, 2014). Furthermore, given the complexity of the problem and the significant portion of time that children spend in school, the issue should be addressed in the school setting (Powell., 2016). Quality of life for obese school-age children should receive particular attention, because of the detrimental effects of this condition on children's health and school functioning, often leading to stigmatization and discrimination, weight-based teasing and bullying, and various associated psychological and mental consequences (Saarni., 2011). Therefore, the aim of the current study was to explore quality of life among school-age

children suffering from obesity in Cairo governorate. In order to fulfill this aim, the specific objectives were to:

- i. Assess physical, social, emotional, and school QoL for obese school-age children.
- ii. Assess physical, social, emotional, and school QoL from the perspectives of the mothers of participating children.
- iii. Identify relations between QoL for obese children and age, gender, grade level, family income, and the mother's level of education.

To achieve these objectives, the following research questions were examined:

1. What is the status of quality of life of obese school-age children?
2. What is the status of QoL of obese school-age children from their mothers' perspectives?
3. What is the relation between QoL for obese school-age children and age, gender, grade level, family income, and the mother's level of education?

Methodology:

Design:

The study design was a descriptive correlational cross-sectional design.

Setting:

The study was conducted in selected governmental primary schools in the Cairo governorate. According to the Ministry of Education (2016), there are 840 governmental primary schools in Cairo (MOH, 2016).

Sampling:

In the current study, the sample size was calculated using the equation proposed by Steven K. Thompson (*Thompson.,2012*). Given a 5% margin of error and a confidence level of 95%, a total of 16 schools were included in the study. Multistage sampling was conducted, through three stages: the Cairo governorate was divided into 4 geographical regions (East, West, North, and South); a simple random sample was used to select 16 schools (4 school from each region) distributed as follow: from the North region; Ahmed Abdulaziz, Mahmud Sami Albarodi, Abobaker Alsedek, and Alzahraa schools, from the East region; Aldemrdash, Emad Ali Kamel, Ahmed Shawki, and Alwadi schools, from the West region; Soliman Basha, Abo Alfaj, Elzamalik, and Alnaser schools, and from the South region; Elbasateen, Elsalam, Gamal Abdalnaser, Talat Harb schools. Finally, all students and their mothers who met inclusion criteria were included. In total, 200 children and their mothers agreed to participate in the study.

Inclusion Criteria:

- Obese (BMI > 25) children and their mothers.
- Aged 6-12 years.
- Explicitly consent given for participation in the study.

Data Collection Tools:

Two tool were used for data collection
Firsttool: Pre-designed Questionnaire interviewing Format which consisted of three parts:

- The first part focused on socio-demographic data for children such as age, gender, grade level, their parents' educational levels and family income.

- The second part focused on medical and family history such as child's height and weight to calculate BMI, positive family history of obesity, kind of relationship with obese family members, history of chronic diseases, surgical operation and psychological problems. The classification for body mass index (BMI) was conducted in accordance with officially accepted ranges (**Powers.,& Geissler., 2009**):

- ✓ Pre-obese: (25-29.9)
- ✓ Obese :
- Class I : (30-34.9)
- Class II : (35-39.9)
- Class III : (≥ 40)

- The third part focused on the nutritional habits of children such as eating three meals daily, eating food while watching TV, drinking adequate amount of water daily (2-3 liter/day), and performing exercises regularly.

- **The second tool:** Pediatric Quality of Life Inventory version 4.0 (**Alderfer & Marsac.,2013**). Consisted of two part, **part one:** assessed children health-related quality of life such as physical (8 items), emotional (5 items), social (5 items) and school functioning (5 items) domains. Responses in this part were collected utilizing a three-point Likert scale containing three response options; frequently (scoring 3-2.34), sometimes (2.33 – 1.67), and rarely (1.66 – 1). The cut-off point for the weighted mean was 2.33, accrued from the three-point response options, in which any item that weighed 2.33 and above signified a good QoL and any item less than 2.33 implied a poor QoL. **Part two:** Assessed the mothers' perspectives on the QoL of their children which focused on the same domains mentioned in the fourth part.

- **Content validity:**

It was tested through five experts from the staff of Faculty of Nursing, Community Health Nursing Department, Ain Shams University.

Reliability:

The reliability of the items was analyzed using Cronbach's alpha coefficient for each domain, with QoL items (23 items) measured at 0.87.

QoL Dimensions	No. of items	Cronbach's alpha
Physical	8	0.82
Emotional	5	0.61
Social	5	0.78
School functioning	5	0.70
Total items	23	0.87

Administrative Design:

After explanation of purpose of the study, an official permission was granted by submission of formal letter issued from the administrators of Faculty of Nursing, Ain Shams University to the administrators of the previously mentioned settings. An official permission was obtained from directors of selected schools after that the researchers met each school's director and explained the aim of the study to facilitate researchers' work. Also, a copy of study tools was given to them before data collection.

Ethical consideration:

An official permission was obtained. A clear and simple clarification about the aims and nature of the study was explained to all participant mothers. Consent was obtained from the selected mothers to ensure willingness to engage in the study. Mothers' participation was voluntary; they can withdraw from the study at any time. The

researchers ensured confidentiality of the participant mothers' personal data and the study hasn't any harmful effect on them.

Operational design:

Pilot study:

was conducted on 10 children and their mothers to test the applicability of the study and to test clarity of the designed questionnaire, as well as to estimate the time needed for the tool, pilot study were excluded from the study's sample to address potential ambiguity in the tool and ensure the clarity of the items, as well as to ascertain the time required for accurate data collection. Besides, evaluation of the feasibility of the study process. Necessary modifications were carried out and the final iteration of the tool was developed.

Filed work:

The actual fieldwork for the process of the data collection during scholastic year 2016/2017 and was consumed six month on beginning of October 2016 and was completed by the end April 2017. The questionnaire was administered by researchers in the class room after permission from teacher to use class time for data collection, student were also asked to omit their names when filling out the tool. Researchers allocated 2 days each week (Wednesday and Thursday), from 8 AM – 12 PM. The researcher meet the mother's at the selected study settings in separated room. 4 - 6 mothers / day.

Statistical design:

The data were analyzed using the Statistical Package for Social Sciences (SPSS) Version 20. For the purpose of descriptive statistical analysis, frequencies and percentages were used for all variables included in the study in order to describe the

demographic data and explore the QoL of children and their mothers.

This was supplemented by arithmetic means and standard deviations. Inferential analysis was conducted utilizing the Chi-Square test, in order to enable the relationship and association between variables to be examined. The internal consistency of the tool was measured by calculating the Cronbach's alpha.

Significance of results

When $P < 0.05$ it is statistically significant difference.

When $P < 0.01$ or $P < 0.001$ it is high significant difference.

Results:

Table (1): Frequency and percentage distribution of studied children and their parents according their socio-demographic characteristics (N=200).

Items	N	(%)
Age (years): Mean \pm SD	9.37 \pm 1.8	
Gender		
Boys	106	53
Girls	94	47
Grade level:		
1-3	92	46
4-6	108	54
Mother's educational level:		
Not read and write	20	10
Read & Write	26	13
Basic education	26	13
Secondary school	60	30
Bachelor	64	32
Others	4	2
Father's educational level:		
Not read & write	8	4
Read & Write	28	14
Basic education	14	7
Secondary school	58	29
Bachelor	88	44
Diploma	4	2
Family income:		
Enough to family needs	52	26

Table (1): Shows that the mean age of the participating school children was 9.37 ± 1.8 . 53% of the sample were boys and 47% were girls. The largest enrollment bracket included grades 4-6 (54%). Concerning parental education, 32% of mothers and 44% of fathers were educated to have Bachelor degree level and 26% of the families had a family income that was sufficient to meet their needs.

Table (2): Frequency and percentage distribution of studied children according to their medical history (N=200).

Items	N	%
BMI:		
Pre-obese: (25-29.9)	73	36.5
Obese:	(127)	(63.5)
Class I: (30-34.9)	37	18.5
Class II: (35-39.9)	40	20.0
Class III: (≥ 40)	50	25.0
Positive family history for obesity:	139	69.5
*Kin-relationship: (N=139)	(139)	(69.5)
Close to first degree	103	74.1
Second degree	33	23.7
Distant relationship	9	6.5
Presence of chronic disease	41	20.5
Diabetes		
History for surgical operation:	59	29.5
Presence of psychological problems such as anxiety and stress	55	27.5

Table (2): Shows that 63.5% of the children were obese and 25% of them had obesity class III. 69.5% of the children have a positive family history of obesity, with kin-relationship close to first degree in 74.1% of cases. In addition, 20.5% have chronic diseases and 27.5% have psychological problems.

Table (3): Distribution of studied children according to their life style (N=200).

Items	Mean ± SD	Rank	Frequently		Sometime		Rarely	
			N	%	N	%	N	%
Eat three meals daily	2.7±0.51	1	158	79	34	17	8	4
Eat snacks between meals	2.5±0.66	2	120	60	62	31	18	9
Eat candy food	2.7±0.56	1	151	75.5	38	19	11	5.5
Eat fast food	2.5±0.67	2	122	61	58	29	20	10
Eat food from food hawkers	2.4±0.76	3	110	55	56	28	34	17
Eat preserved and canned food	2.3±0.71	4	98	49	74	37	28	14
Eat food while watching TV	2.5±0.62	2	126	63	60	30	14	7
Drink fresh and homemade juices	2.3±0.62	4	83	41.5	100	50	17	8.5
Drink adequate amount of water daily (2-3 liter/day)	2.2±0.62	5	70	35	110	55	20	10
Sleep immediately after eating	2.4±0.65	3	104	52	78	39	18	9
Sleep about 7 to 9 hours daily	2.5±0.51	2	120	60	78	39	2	1
Exercises regularly	1.7±0.64	6	20	10	104	52	67	38

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Table (3): Shows that regular exercise is the least habit, with the lowest rank (mean 1.7 ± 0.64), followed by drinking adequate amounts of water daily (mean 2.2 ± 0.62). The highest ranked habits were eating three meals daily (2.7 ± 0.51), and eating candy food (2.7 ± 0.56).

Table (4): Distribution of studied children according to QoL dimensions.

Problem	Mean \pm SD	Frequently n (%)	Sometime n (%)	Rarely n (%)
Physical:				
Walking more than one block.	1.93 ± 0.68	40 (20)	106 (53)	54 (27)
Running	2.3 ± 0.61	78 (39)	106 (53)	16 (8)
Participating in sports, activity or exercise.	2.1 ± 0.59	48 (24)	126 (63)	26 (13)
Lifting something heavy	2.1 ± 0.68	60 (30)	104 (52)	36 (18)
Taking a bath or shower by him or herself	1.5 ± 0.62	14 (7)	80 (40)	106 (53)
Doing chores around the house.	1.8 ± 0.70	37 (18.5)	95 (47.5)	68 (34)
Having hurts or aches	1.8 ± 0.71	38 (19)	95 (47.5)	67 (33.5)
Low energy level	2 ± 0.65	48 (24)	113 (56.5)	39 (19.5)
Emotional:				
I feel afraid or scared	1.8 ± 0.66	32 (16)	108 (54)	60 (30)
I feel sad or blue	1.6 ± 0.59	14 (7)	110 (55)	76 (38)
I feel angry	1.4 ± 0.71	26 (13)	32 (16)	142 (71)
Trouble sleeping	1.6 ± 0.63	18 (9)	96 (48)	86 (43)
I worry about what will happen to me.	1.7 ± 0.65	26 (13)	104 (52)	70 (35)
Social:				
Getting along with other children	1.86 ± 0.63	28 (14)	116 (58)	56 (28)
Other kids not wanting to be his or her friend	1.89 ± 0.71	40 (20)	98 (49)	62 (31)
Getting teased by other children	1.9 ± 0.69	47 (23.5)	105 (52.5)	48 (24)
Not able to do things that other children in his or her age can do.	2 ± 0.62	40 (20)	122 (61)	38 (19)
Keeping up when playing with other children	1.86 ± 0.58	22 (11)	128 (64)	50 (25)
School:				
Paying attention in class	1.85 ± 0.67	32 (16)	106 (53)	62 (31)
Forgetting things	2.1 ± 0.56	48 (24)	132 (66)	20 (10)
Keeping up with schoolwork	1.8 ± 0.60	24 (12)	124 (62)	52 (26)
Missing school because of not feeling well	1.6 ± 0.71	28 (14)	68 (34)	104 (52)
Missing school to go to the doctor or hospital	1.5 ± 0.63	16 (8)	80 (40)	104 (52)

Table (4): Shows that weighted means for physical, social, emotional, and school dimensions (1.96 ± 0.43 ; 1.94 ± 0.51 ; 1.65 ± 0.39 ; 1.80 ± 0.43 respectively). These values indicate a poor QoL, because they are less than the cut-off point (2.33).

Fig. (1): Weighted mean for QoL dimensions.

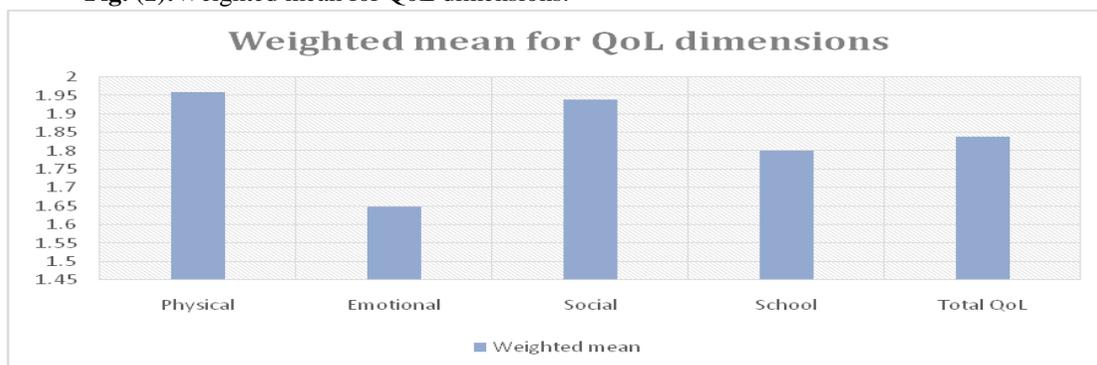


Figure (1): This figure illustrates that all of the QoL dimension were less than the cut-off point (2.33), indicating that the children had a poor QoL. As can be seen in the figure above, the lowest ranked dimension was emotional, followed by the school dimension.

Table (5): Distribution of the children’s quality of life from their mothers’ perspectives.

Problem	Mean ± SD	Frequently N (%)	Sometime N (%)	Rarely N (%)
Physical:				
Walking more than one block.	2.01±0.68	48 (24)	106 (53)	46 (23)
Running	2.3±0.63	78 (39)	102 (51)	20 (10)
Participating in sports, activity or exercise.	2.1±0.57	44 (22)	132 (66)	24 (12)
Lifting something heavy	2.1±0.60	54 (27)	122 (61)	24 (12)
Taking a bath or shower by him or herself	1.7±0.66	22 (11)	94 (47)	84 (42)
Doing chores around the house.	1.9±0.66	36 (18)	112 (56)	52 (26)
Having hurts or aches	2.01±0.68	48 (24)	106 (53)	46 (23)
Low energy level	2.2±0.64	26 (13)	104 (52)	70 (35)
Weighted mean ± SD		2.04 ±0.43		
Emotional:				
I feel afraid or scared	1.7±0.65	26 (13)	104 (52)	70 (35)
I feel sad or blue	1.7±0.68	30 (15)	98 (49)	72 (36)
I feel angry	1.9±0.78	60 (30)	78 (39)	62 (31)
Trouble sleeping	1.8±0.73	39 (19.5)	86 (43)	75 (37.5)
I worry about what will happen to me.	1.8±0.75	45 (22.5)	83 (41.5)	72 (36.5)
Weighted mean ± SD		1.84±0.50		
Social:				
Getting along with other children	1.92±0.60		127 (63.5)	44 (22)
Other kids not wanting to be his or her friend	1.80±0.68	29 (14.5)	99 (49.5)	70 (35)
Getting teased by other children	2.06±0.68	31 (15.5)	107 (53.5)	40 (20)
Not able to do things that other children in his or her age can do.	2.04±0.62	53 (26.5)	123 (61.5)	34 (17)
Keeping up when playing with other children	1.93±0.59	43 (21.5)	129 (64.5)	42 (21)
Weighted mean ± SD		1.96±0.48		
School:				
Paying attention in class	1.93±0.58	28 (14)	130 (65)	42 (21)
Forgetting things	2.1±0.61	58 (29)	118 (59)	24 (12)
Keeping up with schoolwork	1.93±0.55	24 (12)	138 (69)	38 (19)
Missing school because of not feeling well	1.64±0.66	21 (10.5)	87 (43.5)	92 (46)
Missing school to go to the doctor or hospital	1.62±0.71	28 (14)	68 (34)	104 (52)
Weighted mean ± SD		1.85±0.41		

Table (5): The QoL dimensions of children from the mothers' perspective. Weighted means for physical, emotional, social, and school dimensions (2.04 ± 0.43 , 1.84 ± 0.50 , 1.96 ± 0.48 , 1.85 ± 0.41 respectively) indicated poor QoL, because they were less than the cut-off point (2.33).

Fig (2): Weighted mean for QoL dimensions of children from their mothers' perspectives.

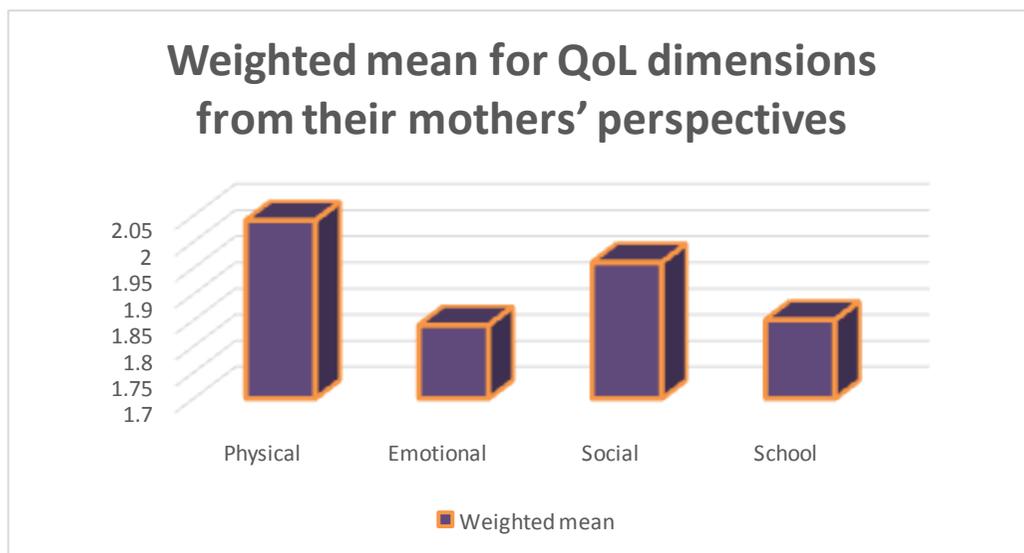


Figure (2): Shows that weighted means for physical, emotional, social, and school dimensions (2.04 ± 0.43 , 1.84 ± 0.50 , 1.96 ± 0.48 , 1.85 ± 0.41 respectively) indicated poor QoL, because they were less than the cut-off point (2.33).

Table (6): Relationship between the characteristics of the studied children and total quality of life score.

Total score of QoL	Variables								Chi	P Value	
	Age										
	6-9				10-12						
Good	8		4%		20		10%			4.21	0.04*
Poor	85		42.5%		87		43.5%				
	Gender										
	Boys				Girls						
Good	11		5.5%		17		8.5%			2.45	0.18
Poor	95		47.5%		77		38.5%				
	Grade level										
	1-3				4-6						
Good	12		6%		16		8%			0.13	0.72
Poor	80		40%		92		46%				
	BMI										
	Pre-obese		Obese Class I		Obese Class II		Obese Class III				
Good	6	3%	9	4.5%	3	1.5%	10	5%		8.2	0.04*
Poor	67	33.5%	28	14%	37	18.5%	40	20%			
	Mother's educational level										
	Not read & write	Read & Write	Basic education	Secondary school	Bachelor	Others					
Good	5 (2.5%)	11 (5.5%)	0	6 (3%)	6 (3%)	0				26.13	0.000**
Poor	15 (7.5%)	15 (7.5%)	26 (13%)	54 (27%)	58 (29%)	(4 2%)					
	Family income										
	Enough				Not enough						
Good	12		6%		16		8%			4.81	0.02*
Poor	40		20%		132		66%				

*P value is significant at the < 0.05 level **P value is highly significant at the level <0.001

Table (6): Shows that there was a statistically significant difference between age, BMI, family income and total score of QoL. A highly statistically significant difference is also evident between the educational level of mothers and the total QoL score of their children, whereas a non-statistically significant difference exists between gender, grade level and total QoL.

Discussion:

Childhood obesity is a condition that can have a profoundly harmful impact on the physical, emotional, mental and social dimensions of a child's life (Ahuja, et al, 2014). The health consequences of this condition are not limited to physical health, rather they can potentially include body dissatisfaction, negative body image, low self-esteem, anxiety, depression, stigmatization, and social marginalization, all of which can adversely influence the psychological and social health of children (Paryati, et al, 2016).

Socioeconomic and demographic characteristics influence the HRQOL of obese school children to a great extent. In the current study, the mean age of the participating children was 9.37 ± 1.8 , years and more than half of them were boys, this may be because in today's culture; weight can be a sensitive subject, especially for girls, this result in contrast the distribution reported by (Kunwar, et al, 2015) who found a similar ratio between boys and girls when studying obesity among school children in India. Also (Namdev, et al, 2014) reported that more than half of the obese children in their study of school children in India were girls.

Also the results of this study revealed that two thirds of the children were obese and a quarter of them had class III obesity, this means that the childhood obesity became a prominent health problem in schools which deserves careful attention, this may be most of them as mentioned in table 3 reported an increased intake of high calorie foods (like beverages, sweets, chocolates, junk food and fast foods - chips, wafers, pizza, noodles, sandwiches, street foods and bakery products). The finding consisted with (Stacey, et al, 2016) also found that less than 50% of school children could be classified as obese. More than two thirds of the children in current study had positive family history of

obesity, this result support the link between childhood obesity and a family history of obesity and comes in agreement with previous studies (CDC, 2015, Corica, et al, 2016) which asserted that a family history of obesity increases the risk of childhood obesity.

Regarding psychological problems, less than a third of participants in the current study reported these kinds of issues such as depression anxiety and stress, this result may be because obesity can make it harder for children to participate in activities. Furthermore, these children become a target for bullying because of their excessive weight. The findings of the study done by (Sagar, & Gupta, 2016) reported that there were numerous psychological factors and psychiatric factors such as depression, anxiety, eating disorder, stress, body shape concerns, and low self-esteem associated with childhood obesity and obese children experience a number of psycho-social problems that significantly affect their quality of life and wellbeing. A study done by (Rankin, et al, 2016) also asserted that childhood obesity was associated with psychological comorbidities, such as depression, emotional and behavioral disorders, lower scores on health-related quality of life metrics, and poorer self-esteem during childhood.

The findings pertaining to nutritional habits also supported the position outlined in the literature, with the least popular habitual behaviors among the studied children being regular exercise and adequate daily consumption of water, whereas eating candy, eating fast food and eating while watching entertainment all ranked highly. A child's primary exposure to healthy or unhealthy nutritional habits is usually through families and schools, if both parents are working so, they have not enough time to guide their children with healthy nutritional habits. In their study of healthy eating habits in the

United States, (*Maureen., et al, 2013*) found similar results and suggested that caregivers should separate mealtimes from playtimes and remove distractions (toys, games, or television) from children during mealtimes, because these factors directly increase children weight. Given that the central physical cause of overweight and obesity is the imbalance of energy intake from food and energy expended through physical activity, this physical problem is most often the causal factor in childhood obesity (*Williams., & Greene., 2016*).

Differences in specific cases may be attributable to the multifactorial nature of obese genetic factors, such as positive family history and low physical activity, which can be exacerbated by children mirroring poor dietary choices from their parents and a general lack of accurate dietary education.

The examination of the dimensions of QoL in this study found that children had poor QoL in all dimensions, these results are logical consequences for the previously mentioned reasons related to the physical activity of those children, as well as their exposure to social isolation due to the harassment they are exposed to because of their extra weight. This result supporting the findings of earlier studies (*Powell., 2016*), which found that children with obesity typically report a significantly lower level of QoL than children of normal weight (*Treviño., et al, 2013; Wallander., et al, 2013 Morrison., 2014*). More specifically, obese children reported a poorer QoL in physical, emotional, social, school functioning domains and consequently poorer total quality of life than normal children, which suggests that obesity has a negative impact on the daily life of these youngsters (*Khairy., et al, 2016*). Additionally, the findings of this study support the outcomes of several earlier studies, which reported that obesity can significantly impair children's HRQOL (*Buttitta., et al, 2014; Helseth.,*

2015). However, some have suggested that more evidence is required to prove a strong association between obesity and health related quality of life among children aged 8 to 12 (*Liu., et al, 2016*). Similarly, a study in Kuwait of 98 obese children and their healthy weight peers observed that the only dimension of HRQOL that was lower in the obese children was physical (*Boodai., & Reilly., 2013*).

No statistically significant difference was found between gender and the total QoL score. This support an earlier studies, which found no statistically significant difference between boys and girls in the same age groups, indicating that gender was not a significant factor associated with variations in HRQOL (*Khairy., et al, 2016*). However, a study by (*Black., et al, 2014*) showed that that girls exhibit greater impairment than boys in several domains of functioning with both generic and weight specific measures. Similarly, (*Liu., et al, 2016*) reported associations between obesity and lower HRQOL scores in girls, but did not find corresponding relationships among male students (*Bolton., et al, 2014*). A potential explanation for this may be the difference between boys and girls in the perception of ideal body image, with influence from television, magazines, advertisements and Chinese culture meaning that thinness represents the ideal body image (*Liu., et al, 2016*). In terms of BMI, a statistically significant difference was found between BMI and the total QoL score, although research in pediatric obesity had shown that higher BMI is associate to impairment in HRQOL, for obese children it is similar to children with other chronic diseases (*Black., et al, 2014*).

The current study identified a statistically significant difference between family income and total QoL score, with less than half of the participating families having enough family income. These results could

be due to that obesity rates have a strong and complicated relationship with income and social status in this regard, there is a controversy about the spread of obesity between upper socioeconomic strata and low socioeconomic strata. Researches indicate some authors maintain that higher among low socio-economic groups, whilst others found that obesity is more among children of upper socio-economic groups. A different set of facts here explaining the cultural differences regarding family income and obesity in different countries/cultures. For example, higher income families normally consume more vegetables and natural products, than low-income groups, who tend to eat food that is less nutritious and healthy ([Abdullah, et al, 2016](#)). This supports the assertions made by ([Khairy, et al, 2016](#)), who studied the health-related quality of life in normal and obese children in Egypt and found that only fifty percent of families had enough income. In contrast, ([Ha, et al, 2016](#)) argues that there is no association between family income and childhood obesity.

Concerning the level of education of mothers, the results of this study identified a highly statistically significant relationship between the total QoL score of each child and their mother's educational level. This may be because more educated parents tend to have jobs that require more time and effort, thereby reducing the time available for mothers to spend with their children, reflecting negatively on the nutritional education and care they are able to provide to their offspring. In a study of obesity and its association with decreased health-related quality of life among school-age children in Vietnam, ([Ha, et al, 2016](#)) found that parents with higher educational levels may be adversely affecting the health of their children, despite the expectation more educated parents would be making more informed and healthy lifestyle choices for their families.

Conclusion:

Despite the significant literature that exists on school-age children with obesity, there is nevertheless a need to better understand the multiplicity of factors that contribute to the lower quality of life of these students. This paper has concluded that school-age children in Cairo governorate had a poor QoL, with a statistically significant difference recorded with respect to age, BMI, and family income, and a highly statistical significant difference with the educational level of the mother of each child. However, no statistically significant difference was identified between QoL and gender

Recommendations:

- Establish education programs from school age on wards to teach families about healthy eating habits and raise awareness of health hazards associated with fast food consumption.
- Run education classes in school, delivered by teachers and health care providers, to improve the eating behavior of children at home and school.
- Encourage parents to eat with children to encourage mealtimes to be viewed as pleasant social occasions and thereby enable modeling to occur. While eating together with their caregivers, children will be able to watch others try new foods. This also helps children and caregivers to communicate hunger and satiety, as well as enjoyment of specific foods.
- Increase education and support provided by health professionals (i.e., public health nurses, family physicians and pediatricians).
- Nutrition programs must be improved to ensure that caregivers have the

facilities required to address any issues pertaining to eating behaviors during childhood.

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