

Prevalence and Risk Factors of Overweight and Obesity among Adult Females at Al-Salam Family Health Center, Ismailia City

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Abstract:

Background: Obesity has become an epidemic problem affecting both developed and developing countries. Obesity among females is an independent risk factor for both maternal and non-communicable diseases. **Objectives:** To determine the prevalence of obesity and its associated risk factors among adult females. **Methods:** A cross-sectional study was conducted on overweight and obese adult females attending Al-Salam family health center in Ismailia city (150 participants were randomly selected). The participants were interviewed using a structured questionnaire and their weight and height were measured to calculate the body mass index. **Results:** About three quarters (76%) of the study participants were overweight and obese. Among the risk factors, consumption of grains, smoking and eating while watching TV were significantly related to overweight and obesity, while hypertension and fatty liver were the most statistically significant co-morbidities ($P = 0.025$ and 0.004 respectively). **Conclusion:** The study has revealed the high percentage of overweight and obesity among adult females, which may have a negative effect on the maternal health. Factors that may be associated with overweight and obesity included dietary pattern, lifestyle behaviors, and obesity co-morbidities. **Keywords:** Obesity, Overweight, Women Health.

Introduction: Obesity has become an epidemic problem affecting both developed and developing countries.⁽¹⁾ The prevalence of overweight and obesity in the Arab countries has reached a very high level. Moreover, Egypt occupies the 2nd place among these countries after Kuwait.⁽²⁾ There is a negative impact of obesity on women health in many ways. Obesity is an independent risk factor for non-communicable diseases e.g. cardiovascular diseases, cancers, and osteoarthritis.⁽³⁾ On the other hand, maternal and fetal health may be negatively affected by obesity e.g. increased the risk of infertility, postpartum complications, neonatal mortality, and malformation.^(4,5) To the

best of our knowledge, no recent data about the prevalence of obesity among adult females in Ismailia Governorate. Therefore, this study aims to determine the prevalence of adult Egyptian female obesity and the associated risk factors.

Methods: A cross-sectional study was conducted on overweight and obese adult females attending Al-Salam family health center in September 2017. The center is located in Al Salam district (an urban area in Ismailia city). The sample (150 participants) was selected randomly from females attending the center over one month, after fulfilling the inclusion criteria (adult females, with BMI at or more than 25 kg/m^2).

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Overweight was defined as body mass index (BMI) is between 25.00 - 29.99 kg/m², while obesity was considered when BMI \geq 30 Kg/m².⁽³⁾ Pregnant women and patients with secondary obesity were excluded, as they can't be assessed by measures of BMI. The participants were interviewed using a validated questionnaire and their weight and height were measured to calculate the body mass index (weight/height²). The questionnaire contained three sections: 1) Socio-demographic status. It contained 7 domains: Education, occupation, family, family possessions, economic, home sanitation and healthcare domains, with a total score of 84. The socioeconomic level was classified into very low, low, middle and high levels depending on the quartiles of the score calculated.⁽⁶⁾ 2) Obesity assessment: to assess the associated risk factors and co-morbidities of overweight and obesity.⁽⁷⁾ 3) Food Frequency: A modified checklist from the Centers for Disease Control and Prevention (CDC) to assess the nutritional habits.⁽⁸⁾ The dependent outcome variables were overweight and obesity, while the independent variables were lifestyle and dietary habits.

The data were analyzed using SPSS (Statistical Package of Social Science) Version 22 for Windows software. Data were presented using

descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. Comparison between qualitative variables was performed using Chi-square or Fisher's exact test. Backward conditional logistic regression analysis was done for risk factors of obesity. For all statistical analysis, the level of significance considered was < 0.05.

All patient information and data were highly confidential. Procedures and data collection were conformed to institutional guidelines that comply with national and international laws and policies. Approval was obtained from both the ministry of health and the ethics committee in the faculty of medicine, Suez Canal University. Informed consent was obtained from participants to be included in the study.

Results: Among 150 studied females attending Al-Salam family health center in Ismailia, More than half of the participants (58%) were housewives and 48% had a secondary education with the mean age of 34.1±10.6. About two thirds (68.7%) had more than 5 equipment from the main group of equipment such as (fridge, TV, car, mobile, air condition, etc.) and the crowding index indicates that more than one person/ room

represents about three-quarter of the study population. About half of the study participants (53%) had just met their routine expenses; while 33% received their health services from the free governmental health facilities (Table-1).

According to the overall scale, the socio-demographic status of the study participants was classified into four categories; very low (20%), low (30%), middle (24%) and high (26%) (Figure- 1). On the other hand, Table (2) shows no statistically significant relationship between the overall scale of socio-demographic status and overweight/obesity.

The percentage of overweight and obesity among the participants according to BMI was 76% (33% were overweight, while 43% were obese) (Figure-2).

Table(3) shows the food frequency per number of serving perceived by the study participant per week; where the highest intake was for grains (89% had grains >5times/week), while 13% had vegetables and fruits 1-2 times/week.

About 90% eat fast food less than twice per week, while about three quarters eat a medium sized meal (as perceived by the participants), while about two-thirds stop eating until feeling completely full and less than two-thirds eat meals in front of TV daily. While

overweight and obesity are significantly associated only with eating in front of the TV (Table-4). The lifestyle behavior in the form of physical activity and smoking status of the study participants are presented in Table (5) and shows that 44.7% are passive smokers, and 13.3% are physically inactive. Furthermore, the obesity has statistically significant relation with smoking status ($p = 0.003$).

Among the overweight and obesity co-morbidities of the study participants, there were 11.3% diabetic, 10.7% hypertensive, and 52% of the study participants had osteoarthritis. A statistically significant relation was detected between overweight and obesity and both hypertension and fatty liver ($P = 0.025$ and 0.004 respectively) (Table-6). Table(7) shows the predictors of obesity as detected by regression analysis. These predictors include house environment as modernization and development, health care services, and smoking.

Discussion: Egypt's demographics have changed in the last few decades, with an increase in the percentage of obese people, especially among adult females.⁽⁸⁾ The study was conducted at Al-Salam family health center, which provides services to the patients in an urban district in the center of Ismailia city. The results of the study showed that the prevalence of female obesity and overweight

was 76%; of the study participants. Similarly, the results of a study in the Eastern Mediterranean Region including Egypt revealed that the prevalence of overweight and obesity among females ranged from 74% to 86%.⁽⁸⁾

In relation to socio-demographic domains, 89.3% of the study participants were from urban slum area in Al Salam district, which means that the majority lack one or more of the basic needs e.g. durable housing of a permanent nature that protects against extreme climate conditions; sufficient living space which means not more than three people sharing the same room; easy access to safe water in sufficient amounts at an affordable price; access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people and security of tenure that prevents forced evictions than the urban area.⁽⁶⁾ This indicates that the poorer people are the most visitors for the government health centers as they can't afford private health facilities, or they don't have health insurance as they were housewives, and also they used to visit the nearest health center to their homes.

Regarding their income, 53.3% of the study participants had just met routine expenses, while 3.3% only were able to save from their income, that indicating low income for the study participants. As

regards the health care, 60.7% had multiple sources of health services as health insurance, governmental or private health facilities.

In our study, the participants demonstrated substantial TV time, and eating in front of TV daily was statistically significantly related overweight and obesity ($p=0.048$). Lifestyle plays a main role in the development and prevention of chronic diseases. Television viewing plays a significant role in the modern lifestyle. People spend most of their time watching the TV, which has profoundly changed the use of their leisure time. The more time in front of the TV, the more snacking and the lesser physical activity people practice.⁽⁹⁾ Many studies have found a link between TV time and increased risk of obesity among adults.⁽¹⁰⁻¹³⁾

About food consumption, there was significant relation between the consumption of grains and overweight and obesity among the study participants, the mean of having grains >5times per week was 29.5 ± 5.8 , which is similar to the previous study in 2016 on Egyptian females that showed that eating a certain type of bread called "*Balady*" is directly linked to weight gain among Egyptian females.⁽¹⁴⁾ Similarly, in Saudi Arabia and Kuwait, the increased food intake is considered as a part of the socialization

process, which is usually based on large gatherings of carbohydrates fat.⁽¹⁵⁾

The physical activity level among the study participants was quite similar in both groups and this relation was not statistically significant. Generally, most Egyptians live a sedentary inactive life, especially in urban settings.⁽¹⁶⁾ Moreover, around 60% of adult Egyptian females are housewives and only 23% of them are governmental employees.⁽¹⁷⁾

A Survey in Egypt showed that much fewer females than males are involved in daily physical activities such as biking, going to a gym, playing sports or having a job which requires physical efforts. Moreover, adult married women do not participate in any physical activity.⁽¹⁶⁾ According to World Health Organization (WHO), 42% of adult Egyptian females, are physically inactive.⁽¹⁷⁾

In this study, there is a significant relationship between overweight and obesity and smoking status; the percentage of passive smoking in obese group was 40.4%. In a similar study, obesity was most prevalent among ex-smokers and least prevalent among current smokers. Moreover, it was shown that ex-smokers usually gain weight within the first year of abstinence.⁽¹⁷⁾ While a study in Korea had shown that in Korean adolescents, smoking frequency

and cigarette consumption were associated with weight loss.⁽¹⁸⁾

Obesity is associated with high morbidity and mortality It is also a major independent risk factor for chronic diseases e.g. cardiovascular disease and diabetes mellitus..⁽¹⁹⁾ In this study, a statistically significant relationship was detected between overweight and obesity and both hypertension and fatty liver (P =0.025 and 0.004 respectively). Many studies have stated that the risk of obesity increases in those with hypertension, and the relationship between obesity and hypertension differs according to certain factors e.g. age, gender, geographical area, and race.⁽²⁰⁾ Similarly, in China, the relationship between obesity and hypertension has been proposed in many studies.⁽²¹⁾ So, Hypertension is closely associated with obesity,⁽²²⁾ and in this study, we confirmed the correlations between hypertension and overweight. Although obesity is highly associated with fatty liver, it is not evident whether non-alcoholic fatty liver disease (NAFLD) is a cause or a consequence of metabolic dysfunction.⁽²³⁾

Limitations of the study: This study has a number of limitations that warrant mention: First, this study was cross-sectional that limits the causal interpretation of the associations

described, because it does not guarantee the correct temporal order of events. Second, the data collection depended on patient recall, that may lead to recall bias.

Conclusion: This study has revealed the high prevalence of obesity in Egypt. The prevalence of overweight and obesity is increasing among females compared with the other studies about the prevalence of obesity in Egypt. It revealed the rapid pace of its increasing prevalence among poor people, with more unhealthy diet and physical inactivity. It also discussed other factors that are associated with overweight and obesity occurrences such as dietary pattern, lifestyle behaviors, and obesity co-morbidities.

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Table 1: Socio-demographic characteristics of the studied population (N= 150).

Characteristics	No.	%
Age (mean \pmSD)	34.1 \pm 10.6	
Job		
▪ Housewife	87	58.0
▪ Unskilled manual work	5	3.3
▪ Skilled manual work	13	8.7
▪ Trades/business	0	0.0
▪ Semi-professional/clerk	28	18.7
▪ Professional	17	11.3
Education		
▪ Illiterate	11	7.3
▪ Read and write	7	4.7
▪ Primary	10	6.7
▪ Preparatory	12	8.0
▪ Secondary	72	48.0
▪ Intermediate (2 years) Institute	13	8.7
▪ Graduate	23	15.3
▪ Postgraduate	2	1.3
Economy		
▪ In debt	11	7.3
▪ Just meet routine expenses	80	53.3
▪ Meet routine expenses and emergencies	54	36.0
▪ Able to save/invest	5	3.3
Health care		
▪ Traditional healer /self-care	2	1.3
▪ More than one source	91	60.7
▪ Free governmental health services	49	32.7
▪ Health insurance	1	0.7
▪ Private health facilities	7	4.7
Residence		
▪ Urban	16	10.7
▪ Urban (Slum)	134	89.3
Crowding index		
▪ \leq one person /room	37	24.7
▪ $>$ one person /room	113	75.3
Family equipment		
▪ 5 equipment	47	31.3
▪ \geq 5 equipment	103	68.7
Positive family history of obesity	83	55.3

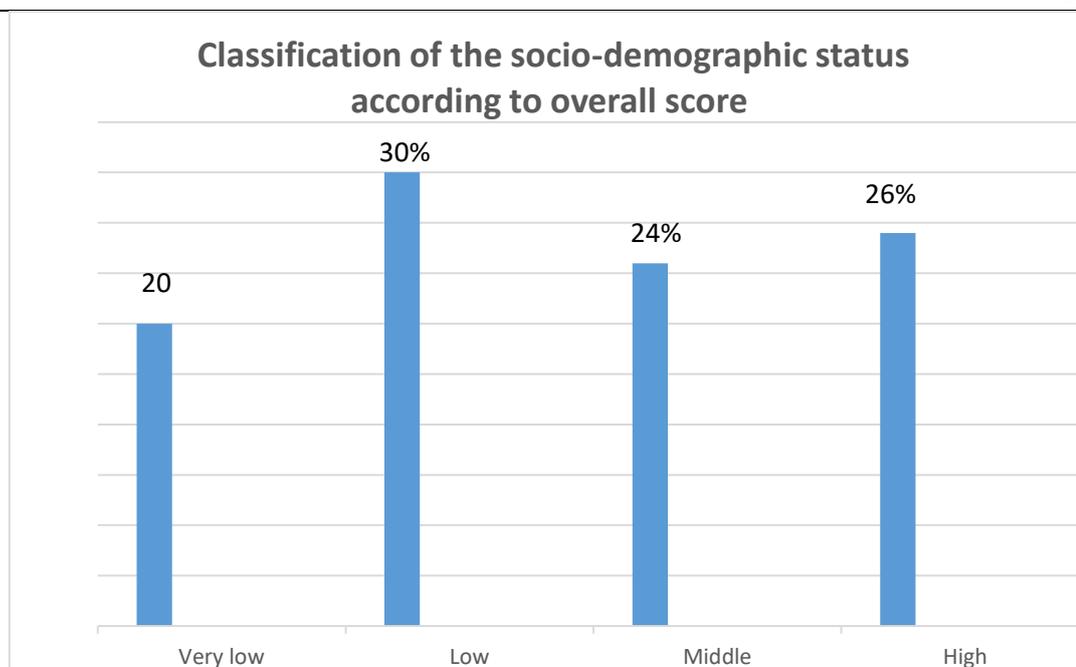


Figure (1): Classification of the socio-demographic status according to the overall score

Table (2): Relationship between the overall scale of socio-demographic status and weight classes

Socio-demographic status	Normal weight No. (%)	Overweight/obese No. (%)	X ²	P- value
▪ Very low	8 (22.2)	22 (19.3)	0.202	0.977
▪ Low	11 (30.6)	34 (29.8)		
▪ Middle	8 (22.2)	28 (24.6)		
▪ High	9 (25.0)	30 (26.3)		

* Statistically significant at p-value <0.05

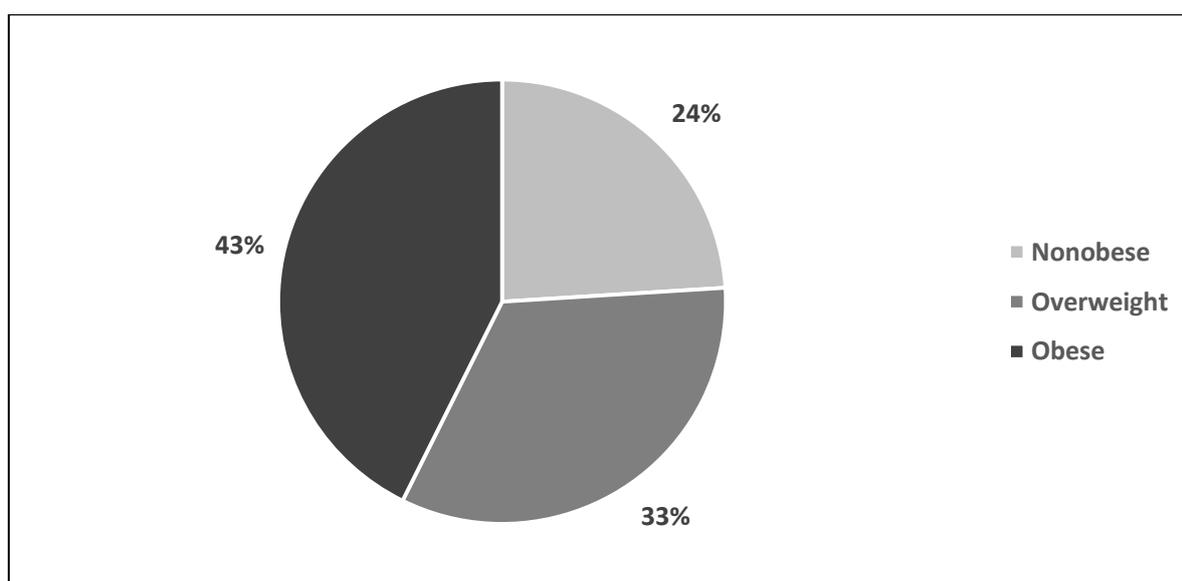


Figure (2): Distribution of weight classes among the study participants according to BMI.

Table (3): Food frequency per number of serving perceived per week among the studied sample (N= 150)

Food type Frequency	Grain		Meat and egg		Coffee		Milk		Vegetables and fruits		Sweets	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
▪ Never/rarely	0	0%	0	0%	34	23%	27	18%	0	0%	66	44%
▪ 1-2times/week	6	4%	68	45%	12	14%	44	29%	19	13%	52	35%
▪ 3-4 times/week	10	7%	34	23%	6	4%	23	15%	30	20%	9	6%
▪ >5 times /week	134	89%	48	32%	89	59%	56	37%	101	67%	23	15%
Total	150	100	150	100	150	100	150	100	150	100	150	100

Table 4: The eating habits in relation to overweight/obesity among the studied sample (N=150)

Food frequency	Normal weight No. (%)	Overweight /Obese No. (%)	X ²	P value
The frequency of fast food per week			Fisher's exact test	0.520
▪ Never or once	34(94.4)	102(89.5)		
▪ More than twice	2(5.6)	12(10.5)		
Perceived meal size by the participant			2.642	0.267
▪ Small	9(25.0)	22(19.3)		
▪ Medium	27(75.0)	85(74.6)		
▪ Big	0(0.0)	7(6.1)		
When participant stops eating each meal			1.466	0.481
▪ Until feeling half full	10(27.8)	35(31.3)		
▪ Until feeling completely full	22(61.1)	71(63.4)		
▪ Until the plate is empty	4(11.1)	6(5.4)		
Eating meals in front of the TV			5.706	0.048*
▪ Daily	16(44.4)	76(66.7)		
▪ ≤ 2 /week	14(38.9)	27(23.7)		
▪ ≥ 2/week	6(16.7)	11(9.6)		

* Statistically significant at p-value <0.05

Table (5): Relationship between lifestyle behaviors and overweight/obesity among the studied sample (N=150)

Lifestyle behavior	Normal weight No. (%)	Overweight /Obese No. (%)	X ²	P-value
Smoking status				
▪ Never	13(36.1)	68(59.6)	11.121	0.003*
▪ Previous	2(5.6)	0(0.0)		
▪ Passive	21(58.2)	46(40.4)		
Physical activity				
▪ Inactive	4(11.1)	16(14.0)	Fisher's exact test	0.784
▪ Active	32(88.9)	98(86.0)		

* Statistically significant at p-value <0.05

Table (6): Overweight/Obesity co-morbidities in relation to obesity

Co-morbidity	Normal weight No. (%)	Overweight/ Obese No. (%)	X ²	P-value
▪ Diabetes Mellitus	2(5.6)	15(13.2)	1.574	0.248
▪ Cancer	0(0.0)	3(2.6)	0.967	0.579
▪ Congestive heart disease	0(0.0)	3(2.6)	0.967	0.579
▪ Cardiovascular stroke	0(0.0)	4(3.5)	1.298	0.572
▪ Hypertension	0(0.0)	16(14.0)	5.656	0.025*
▪ Asthma	3(8.3)	19(16.7)	1.518	0.218
▪ Obstructive sleep apnea	3(8.3)	14(12.3)	0.424	0.571
▪ Gallbladder disease	2(5.6)	6(5.3)	0.005	1.000
▪ Fatty liver	0(0.0)	22(19.3)	8.141	0.004*
▪ GERD	3(8.3)	25(21.9)	3.331	0.068
▪ Mental irregularities	10(27.8)	29(25.4)	0.078	0.780
▪ Depression	8(22.2)	23(20.2)	0.070	0.791
▪ Osteoarthritis	17(47.2)	61(53.5)	0.433	0.510

* Statistically significant at p-value <0.05

Table (7): Logistic regression analysis for predictors of overweight/obesity

Factors	B	S.E.	P value	OR	95% C.I. for OR
▪ House environment	0.614	0.249	0.014	1.85	1.13-3.01
▪ Health care	0.971	0.42	0.021	2.64	1.16-6.02
▪ Smoking	-1.116	0.438	0.011	0.33	0.14-0.77
▪ Constant	-2.279	1.261	0.071	0.10	

Omnibus test for Model fit (p-value < 0.001) χ^2 (3) = 17.719, P< 0.001

Model summary: -2 Log likelihood= 147.605; Cox & Snell R²=0.111; Nagelkerke R²=0.167

الملخص العربي

معدل انتشار وعوامل الخطورة لزيادة الوزن والسمنة لدى السيدات البالغات المترددات على مركز السلام لطب الأسرة، مدينة الإسماعيلية

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الخلفية: أصبحت السمنة مشكلة وبائية تؤثر على كل من البلدان المتقدمة والنامية. تعد السمنة بين الإناث هي عامل خطورة للأمراض غير المعدية والأمراض المرتبطة بصحة المرأة. **الهدف** من هذه الدراسة هو تقييم مدى انتشار زيادة الوزن والسمنة وعوامل الخطر المرتبطة بهما بين الإناث البالغات. **الطريقة:** أجريت دراسة مقطعية مستعرضة على الإناث ذوات الوزن الزائد والبدنيات اللواتي يحضرن مركز حي السلام لطب الأسرة في مدينة الإسماعيلية (تم اختيار 150 مشاركاً عشوائياً) وتم إخضاعهم لاستبيان المقابلات وقياسات الطول الوزن. **النتائج:** كان حوالي ثلاثة أرباع المشاركين في الدراسة يعانون من زيادة الوزن والسمنة. من بين عوامل الخطر، كان استهلاك الحبوب والتدخين وتناول الطعام أثناء مشاهدة التلفزيون مرتبطاً بشكل كبير بزيادة الوزن والسمنة، في حين كان ارتفاع ضغط الدم والكبد الدهني أكثر الأمراض المرتبطة بزيادة الوزن والسمنة ذات الدلالة الإحصائية. **الخلاصة:** كشفت الدراسة عن ارتفاع نسبة السمنة بين الإناث البالغات، مما قد يؤثر سلباً على صحة الأمهات الحوامل وشملت العوامل التي قد تكون مرتبطة بزيادة الوزن والسمنة الأنماط الغذائية وسلوكيات نمط الحياة والأمراض المصاحبة للسمنة.