

OBESITY AMONG FEMALES ATTENDING AL-QATIF HEALTH CARE CENTERS, EASTERN SAUDI ARABIA: PREVALENCE AND ASSOCIATED FACTORS

Magdy A Darwish¹, Zainab A Al Turki², Amr A Sabra³, Abedaziz M Sebiany¹

¹ Department of Family and Community Medicine, University of Dammam Saudi Arabia, Saudi Arabia

² Qatif Primary Health Care, Ministry of Health, Eastern Province, Saudi Arabia

³ Primary Health Care Division, High Institute of Public Health, Alexandria University, Egypt

Correspondence to: Magdy A Darwish (magdar9123@yahoo.com)

DOI: 10.5455/ijmsph.2014.070720141

Received Date: 03.07.2014

Accepted Date: 07.07.2014

ABSTRACT

Background: Overweight and obesity represent a rapidly growing pandemic of public health concern that affects virtually all ages and socio-economic groups. They are associated with epidemic of chronic diseases all over the world. Gulf countries are at top of the list for this epidemic.

Aims & Objectives: To study the prevalence and factors associated with obesity among females attending Al-Qatif health care centers, Eastern Saudi Arabia.

Materials and Methods: A cross-sectional study was carried out among adult females, attending al Qatif primary health care centers (PHCCs), whose age was ≥ 18 years.

Results: Prevalence of obesity using BMI as a marker was 30.8% while prevalence of overweight was 29% culminating into 59.8% of our study women are above normal body weight. In the studied sample 34.6% had normal BMI, 5.6% were under weight and only 37.5% had an acceptable waist circumference. Significant factors associated with obesity included: age, marriage, unemployment, those with higher education and number of children while there was no significant relation with personal or family income. There was a statistically significant association between obesity as measured by BMI and waist circumference.

Conclusion: Prevalence of overweight and obesity among our study participants was lower than national figures, gulf and other nearby countries and international figures. Having better results in our study reflects regional within country variation which may be explained here by slower urbanization of Al-Qatif region

Key Words: Prevalence; Overweight; Obesity; Body Mass Index; Waist Circumference

Introduction

Overweight and obesity represent a rapidly growing pandemic of public health concern that affect virtually all ages and socio-economic groups.^[1,2] They are associated with hypertension, ischemic heart disease, gallstones, osteoarthritis, type 2 diabetes, sleep apnea, malignancy^[3,4], emotional and social problems in children^[4], impaired quality of life^[4], self-esteem^[5], and depression^[6]. Obesity is the second leading cause of preventable death in the United States of America (USA).^[7] Modest weight control has been shown to improve many risk factors for cardiovascular, pulmonary, and cancer conditions.^[1,7-9]

Globally, around 35% of adults aged 20 and over were overweight in 2008. The mean Body Mass Index (BMI) of the world's population increased dramatically between 1980 and 2008.^[10,11] This was more common in the developed countries; however there has been a major surge in the prevalence of obesity in some of the developing countries, among them, Kingdom of Saudi Arabia (KSA). Such countries have gone through a major economical development over the last 30 years, which has resulted in a significant change in lifestyle with

respect to nutritional habits and exercise. Such changes in lifestyle have led to the emergence of obesity as a major health hazard.^[12]

The available data indicate that the prevalence of adult obesity in KSA is high, and affects women in particular^[13], with a preponderance of abdominal obesity^[14-15]. There are several factors contributing to the high incidence of obesity amongst women. Watching television and eating snacks are the main activities during their leisure time, especially when the majority of women are not employed. Excessive food intake is also responsible for obesity in KSA.^[16] The attitude towards obesity is another important factor.^[17] The traditional, long, comfortable, and wide clothes worn by women prevents them from noticing the gradual gain in weight.^[17] The modernization and affluence in Saudi Arabia over the last three decades has probably caused the problems of obesity in vulnerable persons to surface.^[18] Some might even consider obesity as a sign of affluence.^[19]

Primary health care physicians (PHCPs) are ideally placed to play a dominant role in assessing and managing obesity. Physicians are the most frequently used source

of health information^[20] and have been found to be more cost-effective than dieticians in nutritional counselling for obese and other patients.^[21] Despite these facts, primary health care (PHC) is still underutilized for obesity counselling^[22] and its capacity is usually diminished by a number of limitations^[23] such as short consultation time, patients' low motivation and non-compliance, inadequate teaching materials, lack of reimbursement, low level of physicians' confidence, and a shortage of dieticians.^[24,25] Overweight and mild obesity is under-recognized and under-treated unless they are associated with other medical complications.^[7] The aim of the present study was to estimate the prevalence of obesity among females attending Primary health care centers (PHCCs) in Al Qatif area, Eastern Saudi Arabia.

Materials and Methods

This Cross-sectional study was conducted in primary health care centers (PHCCs) in Qatif, eastern region; Saudi Arabia during the period from beginning of December 2013 till end of January 2014. Study population includes all adult ambulatory Saudi females attending PHCCs whose age is ≥ 18 years. Pregnant, postpartum females during their first six months of delivery and patients with chronic disabling diseases e.g. Diabetes, epilepsy and bronchial asthma were excluded. Five centers were randomly selected from a total of 29 PHCCs by systematic random sampling taking every 6th center from list provided by MOH. All females attending the selected centers were approached. A total number of 630 females accepted to participate after explanation, answering all their questions and getting their informed consent.

Questionnaires were collected after being completed. The anthropometric measurements (height, weight and waist circumference), were taken to females invited to the vital signs room.

Data were collected using an interviewer administered questionnaire composed of two main parts:

- First part: Socio-demographic characters of females such as age, marital status, number of children, educational level, presence of family problems, personal and family income.
- Second part: Assessment of obesity was done using 2 different methods namely; Body Mass Index and waist circumference

Body Mass Index (BMI): was classified as, Underweight

(BMI < 18.5 kg/m²); Normal (BMI=18.5-24.99 kg/m²); Overweight (BMI=25-29.99 kg/m²); Obese Class I (BMI=30-34.99 kg/m²); Obese Class II (BMI=35-39.99 kg/m²); and Obese Class III (BMI ≥ 40.0 kg/m²). For the ease of statistical analysis, associations and interpretation of the results, BMI classification was categorized into 4 groups: underweight; normal; overweight, and obese (includes obese class 1, II, and III).^[26]

Waist Circumference: Waist circumference was measured at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest, using a stretch-resistant tape with the tape parallel to the floor with subject standing with feet close together, arms at the side and body weight evenly distributed, measurements were taken at the end of a normal expiration. Each measurement was repeated twice. Waist circumference equal or less than 80 cm was considered acceptable and above 80 cm as not acceptable.^[27]

The data were coded, entered and analyzed in a personal computer using statistical package for social sciences (SPSS) software version 16. Data were presented using descriptive statistics in form of frequencies and percentages for qualitative variables and mean and standard deviation (SD) for quantitative variables. Chi-square test was used as to determine associated factors.

The study was approved by ethical committee of Postgraduate Saudi Board Program, Eastern Province. All questionnaires were anonymous, and collected data were kept confidential and not used except for the study purpose. All necessary approvals including ethical permissions from ministry of health were obtained before starting the research.

Results

Six hundred and thirty females participated in this study from five different primary health care centers in al Qatif area. Mean age was 34.3 years + 9.3SD.

More than half of the participants (53.4%) were in age range 30 to 45 years, Most of the sample was married (73.7%) and most of them have no family problems (89.7%). Educational level of females in the present study was secondary school or diploma (43%) followed by university graduation or above in 37.6%. Almost one third of participants had no children 32.9%, while about one third of them have three to five children (32.4%). More than half (53.4%) of participants were house wives or unemployed. About half of participants had no

personal income (49.5%) while 29.4% had personal income range between 5000 S.R. to less than 15000 S.R. (Table 1). Two hundred eighteen participants (34.6%) were within normal weight range using BMI, underweight were 5.6%, overweight were 29% while obese class I, class II and class III were 16.8%, 8.8%, and 5.2% respectively. Two third of participants had acceptable Waist to hip ratio (66.2%), More than one third of females (37.5%) had acceptable waist circumference (Table 2).

Table-1: Socio-demographic characteristics of the PHC female's attendees (n=630)

Socio-Demographic Characteristics		N	%
Age (years)	15 ≤ 30	203	32.2
	30 ≤ 45	336	53.4
	45 ≤ 60	87	13.8
	≥ 60	4	0.6
	Mean Age in years ± SD = 34.3 ± 9.3		
Marital Status	Single	138	21.9
	Married	464	73.7
	Divorced	17	2.7
	Widowed	11	1.7
Number of Children	No children	207	32.9
	1	61	9.7
	2	101	16.0
	3-5	204	32.4
	≥6	57	9.0
Educational Level	Illiterate	15	2.4
	Read and write	19	3.0
	Elementary school	25	4.0
	Intermediate school	63	10.0
	Secondary school or diploma	271	43.0
Occupation	University and higher	237	37.6
	Unemployed	330	53.4
	Student	61	9.7
	Manual worker	13	2.1
	Professional occupation	226	35.8
Personal Income (Saudi Riyals, S.R.)	No income	321	50.9
	<2000	36	5.7
	2000-<5000	44	7.0
	5000-<10,000	99	15.7
	10000-<15,000	86	13.7
Family Income (Saudi Riyals, S.R.)	≥15,000	44	7.0
	<2000	59	9.4
	2000-<5000	151	24.0
	5000-<10,000	146	23.2
	10000-<15,000	81	12.8
Family Problems	≥15,000	92	14.6
	Refuse to answer	101	16.0
	No	566	89.7
	Marital conflict	31	4.9
	Violence & addiction	2	0.4
	Intellectual disability	5	0.8
	Motor & sensory disability	8	1.3
Multiple wives	10	1.6	
Other	8	1.3	

More than half (59%) of overweight and 54.1% of obese females were in the age group of 30 < 45 years; while 39.9% of females with normal weight were in the younger age group (15 < 30 years), (p < 0.001). Nearly three quarters of obese (78.4%) and 77.6% of overweight females were married while 57.1% of underweight

females were single, (p < 0.001), (Table 3). About 40% of obese and overweight females and 62.9% of underweight were having secondary school or diploma as a level of education, (p < 0.01). Moreover, 56.2% and 55.7% of obese and overweight females were unemployed, (p < 0.01), (Table 3). By studying the association between obesity as measured by BMI and personal and family income, there was no statistical significant association.

There was a statistical significant association between obesity as measured by BMI and waist circumference. Most of the obese (97.4%) and 77 % of overweight females had non acceptable waist circumference. Moreover, 71.6% of females with normal BMI had acceptable waist circumference (Table 4).

Table-2: Distribution of study females according to their BMI and waist circumference (n=630)

Variables		N	%
BMI	Underweight (<18.50)	35	5.6
	Normal range (18.50 - 24.99)	218	34.6
	Overweight (25.00 - 29.99)	183	29.0
	Obese class I (30.00 - 34.99)	106	16.8
	Obese class II (35.00 - 39.99)	55	8.8
	Obese class III (≥40.00)	33	5.2
Waist Circumference	Acceptable (≤80 cm)	236	37.5
	Not acceptable (>80 cm)	394	62.5

Discussion

The results of the present study showed a Prevalence of obesity using BMI as a marker was 30.8% while prevalence of overweight was 29% culminating into 59.8% of our study women are above normal body weight. In the studied sample 34.6% had normal BMI, 5.6% were under weight and only 37.5% had an acceptable waist circumference.

Al Nozha et al examined 17,232 Saudi subjects from selected households. The prevalence of overweight was 36.9%. Overweight was significantly more prevalent in males (42.4%) compared to 31.8% of females. The age-adjusted prevalence of obesity was 35.5% in KSA with an overall prevalence of 35.6%, while severe (gross) obesity was 3.2%. Females were significantly more obese with a prevalence of 44% than males 26.4%.^[28] A community screening conducted by Al-Baghli et al among the Saudi residents of the Eastern Province which reported that Out of 195,874 participants, the overall prevalence of obesity was 43.8%, while 35.1% were overweight. The prevalence of underweight was 1.3%.^[29] Furthermore, regional variation was reported in data analysis from the National Nutrition Survey in Saudi Arabia by Al-Othaimen and Al-Nozha (2007) who reported that prevalence of obesity ranged from 33.9% in Ha'il to 11.7% in Jizan.^[30] Prevalence in Eastern province (27.7%) was only preceded by hail.^[30]

Table-3: Association between obesity and Socio-demographic characters of study females

	Waist Circumference	Underweight (n=35)		Normal (n=218)		Overweight (n=183)		Obese (n=194)		Significance (p-value)
		N	%	N	%	N	%	N	%	
Age (years)	15 ≤ 30	26	74.3	87	39.9	46	25.1	44	22.7	$\chi^2=61.3$ (p<0.001)
	30 ≤ 45	9	25.7	114	52.3	108	59.0	105	54.1	
	45 ≤ 60	0	0.0	16	7.3	27	14.8	44	22.7	
	≥ 60	0	0.0	1	0.5	2	1.1	1	0.5	
Marital Status	Single	20	57.1	57	26.1	33	18.0	28	14.4	$\chi^2=49.25$ (p<0.001)
	Married	14	40.0	156	71.6	142	77.6	152	78.4	
	Divorced	0	0.0	1	0.5	4	2.2	12	6.2	
	Widowed	1	2.9	4	1.8	4	2.2	2	1.0	
Educational Level	Illiterate	0	0.0	3	1.4	5	2.7	7	3.6	$\chi^2=35.7$ (p<0.01)
	Read and write	0	0.0	3	1.4	8	4.4	8	4.1	
	Elementary school	1	2.9	6	2.8	6	3.3	12	6.2	
	Intermediate school	1	2.9	10	4.6	23	12.6	29	14.9	
Number of Children	Secondary school or diploma	22	62.9	101	46.3	71	38.8	77	39.7	$\chi^2=58.1$ (p<0.001)
	University and higher	11	31.4	95	43.6	70	38.3	61	31.4	
	No children	25	71.4	74	33.9	49	26.8	59	30.4	
Occupation	1	3	8.6	27	12.4	17	9.3	14	7.2	$\chi^2=36.62$ (p<0.01)
	2	5	14.3	47	21.6	27	14.8	22	11.3	
	3-5	2	5.7	59	27.1	74	40.4	69	35.6	
	≥6	0	0.0	11	5.0	16	8.7	30	15.5	
Occupation	Unemployed	17	48.6	102	46.8	102	55.7	109	56.2	$\chi^2=36.62$ (p<0.01)
	Student	10	28.5	24	11.0	9	4.9	18	9.3	
	Manual worker	1	2.9	3	1.4	5	2.7	4	2.1	
	Professional occupation	7	20.0	89	40.8	67	33.7	63	32.4	

Table-4: Association between BMI and waist circumference of study females

	Waist Circumference	Underweight (n=35)		Normal (n=218)		Overweight (n=183)		Obese (n=194)		Significance (p-value)
		N	%	N	%	N	%	N	%	
	Acceptable (≤ 80 cm)	33	94.3	156	71.6	42	23.0	5	2.6	$\chi^2=27.4$ (p<0.001)
	Not acceptable (> 80 cm)	2	5.7	62	28.4	141	77.0	189	97.4	

Prevalence rates for obesity and overweight (including obesity) among females in gulf countries were reported as follows, in Bahrain it was 38.0% and 70.3%, In Kuwait it was 49.8 % and 79.5 %, In Qatar it was 38.1 % and 70.2% , In United Arab Emirates, it was 39.9% and 71.2% while In Oman it was 23.8% and 54.2 respectively. Regarding other nearby countries, Prevalence of obesity and Overweight (including obesity) was 44.5% and 75.3% among Egyptian females, among Iraqi females was 33.4% and 65.1% while In Jordon prevalence of obesity and Overweight among Jordanian females was 36.4% and 66.0 % respectively. In USA prevalence of obesity was 34.8% while Overweight was 73.5 among American females.^[13]

Prevalence of obesity among our study sample were lower than national, gulf countries but Oman, other neighbourhood countries and some international figures. Having better results in reflects regional within country variation which may be explained in our study by slower urbanization of Al-Qatif region. Better indices in rural than urban areas have been confirmed in number of studies.

In our study factors significantly associated with obesity

included: age, marriage, unemployment, those with higher education and number of children while there was no significant relation with personal or family income. Age, marriage, number of children and unemployment were reported in number of studies while there was conflicting results regarding socioeconomic status and education

Al-Nuaim et al^[31] showed that age and education were statistically significant predictors of obesity. Also in their study they found that prevalence of obesity was lower in subjects living in rural areas with traditional life-styles than those in more urbanized environments. Soyannwo et al study^[32] Showed that In general, the trend for BMI was to increase with age in both genders, but the curve pattern showed some plateauing from about the age of 50, with a slight decline in later life. Females had significantly higher indices than males, this becoming quite prominent from the 10-14 year age group. Khwaja and Al-Sebai^[33] showed that parity rather than age was a contributing factor to obesity. This appears more likely since the interval between pregnancies is usually short, and does not allow the female to lose the weight gained during pregnancy. This is particularly true in Saudi Arabia, where grand multiparity (the births of five or

more viable infants) is a common occurrence.^[34,35] Khashoggi et al^[36] indicated that age, marital status, having children, and parity was significant predictors for obesity. Other factors were studied, including education and income, which were of no predictive value. Al-Shagrawi et al^[37] conducted a study to evaluate the factors affecting the prevalence of obesity among female Saudi college students. There was a significant relationship between age and social status, with obesity. Al-Rashidi^[38] showed that there was a relationship between social level and weight average. The results showed that weight was higher with higher social level, and it was statistically significant ($p < 0.05$). There is a relationship between BMI and age. The older the students were the higher their BMI, and it was statistically significant ($p < 0.05$). Al-Baghli et al^[29] found that Obesity was higher in housewives, and among the less educated than others ($p < 0.0001$). The peak prevalence of obesity was observed in the age group 50-59 years.

There was a statistical significant association between obesity as measured by BMI and waist circumference. Most of the obese (97.4%) and 77 % of overweight females had non-acceptable waist circumference. Moreover, 71.6% of females with normal BMI had acceptable waist circumference

Huxley et al^[39] concluded that there was convincing evidence that measures of general obesity (e.g. BMI) and measures of abdominal adiposity (e.g. waist circumference) are associated with CVD risk factors. The authors also concluded that there was probable evidence that: measures of abdominal obesity are better than BMI as predictors of CVD risk, although combining BMI with these measures may improve their discriminatory capability.

Seidell^[40] concluded that: waist circumference and waist-hip ratio are both related to increased risk of all-cause mortality, throughout the range of adult BMIs; and that waist circumference is strongly predictive in young and middle aged adults compared to older people and those with low BMI; he also stated that waist circumference alone could replace waist-hip ratio and BMI as a single risk factor for all-cause mortality.

Conclusion

Prevalence of overweight and obesity among our study participants was lower than national, gulf countries and

even international figures. The prevalence of obesity varies across countries. However, less is known about the geographical, within-country variation. Important variations were reported in some countries but not others.^[41,42] Public health preventive strategies should be oriented to counteract the obesity epidemic in the population. Mapping obesity gives a useful tool for professionals working in the field of health promotion.

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Cite this article as: Darwish MA, Al Turki ZA, Sabra AA, Sebiany AM. Obesity among females attending Al-Qatif health care centers, Eastern Saudi Arabia: Prevalence and associated factors. *Int J Med Sci Public Health* 2014;3:1144-1149.

Source of Support: Nil

Conflict of interest: None declared