Socio-economic and Medical Predictors for Obesity among Women Aged 50 Years and More: Case-Control Study

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Abstract:

Background: Obesity is now reaching epidemic proportions and is increasingly recognized as an important public health problem. Epidemiological studies have consistently shown it to be associated with increased risks of morbidity, disability and mortality.

Aim: To examine the impact of different socio-economic and medical characteristics on the development of obesity in women more than 50 years.

Study design: Case-control study, where 125 obese women proved by standard anthropometric measures were allocated as cases. Another 125 women proved to be not obese also by standard anthropometric measures were considered as controls.

Study period: 1st. February 2007 to 1st. October 2007.

Data collection tools: Including, assessment of socio-economic features such as personal characteristics, life events and social context. In addition, previous history of surgical operation, parity, abortion and the presence of one or more of chronic non-communicable diseases were also gained. Social class identification according to occupational social classification then was obtained.

Results: Regarding *Personal Characteristics*; positive family history was found to be significantly associated with the development of obesity (P=0.000), the same thing was applied to sedentary life styles (P=0.000). Furthermore, unhealthy dietary behavior was again significantly associated with the occurrence of obesity (P=0.000). Personality type B, also found to be associated with development of obesity (P=0.000). According to *Life Events*; only social discontinuities in this work appears to be significantly associated with the development of obesity (P= 0.008). According to *Other Variables*, the presence of one or more of chronic non-communicable diseases is found to be associated with the occurrence of obesity (P=0.000), and high parity shows significant association in the development of obesity (P=0.004). A significant association between social class III and obesity was also found (P= 0.022), while social class V plays a significant protection against the development of obesity (P= 0.004).

Conclusion: Women with positive family history, sedentary life, unhealthy dietary behavior, personality type B, social discontinuities, chronic diseases, high parity and being in social class III, are at risk for development of obesity.

Key words: Socio-economic, obese, women.

Introduction:

Overweight and obesity are major public health problems and the most common nutritional disorders [1,2,3]. Both overall and abdominal obesity are associated with non-communicable chronic diseases such as type 2 diabetes, cardiovascular and cerebro-vascular diseases, digestive disorders, and cancer [4, 5]. Furthermore, obesity is a major independent risk factor for the development of hypertension, type 2diabetes, and dyslipidemia [6].

According to the World Health Organization Consultation on Obesity [1], the incidence of obesity has been increasing rapidly since 1990. The prevalence of obesity is also increasing in many developed countries [7] and in many developing countries [8, 9]. The prevalence of obesity in adults is 10% to 25% in most countries of Western Europe and 20% to 25% in some countries in the Americas. This figure rises to 40% for women in eastern European and Mediterranean countries and for black women in the United States, but it is up to 80% in the island of Nauru in the South Pacific. In Arabic countries such as Bahrain, Kuwait, and Jordan, prevalence of obesity is as high as 35%[10], 42% [11], and 49.7% [12], respectively. The prevalence varies not only among regions and countries but also among races and ethnic groups [6].

Obesity is a result of a complex variety of social, behavioral, cultural, environmental, physiological, and genetic factors. Many variables may influence eating behavior and therefore may also influence obesity, including depression, anxiety, stress, social support, race, ethnicity, education and income. It is fairly enough now according to the present evidences, that obesity can be considered as one of the most important chronic non-communicable diseases. Moreover, investigation for risk factors and social conditions that are associated with obesity is

very crucial subjects from the preventive point of view[9, 12]. Both sexes are prone equally to this risk, but each gender should be investigated alone, because each gender culture is considerably differ form the other, according to social, economic and cultural factors.

The aim of the present study is to investigate different socio-economic characteristics and certain medical factors that play a role in the development of obesity in women more 50 years of age.

Subject & Methods:

In order to achieve the aim of the present study, a case-control study design was adopted, 125 obese women (according to body mass index "BMI" ≥ 30) were enrolled in this study as cases according to the following inclusion criteria:

-The participant must be a woman, her age more than 50 years.
-The participant BMI should be ≥ 30.

Another 125 women were chosen as controls with the following inclusion criteria:

-The participant must be woman, her age more than 50 years.
-The participant BMI ≤ 25. .

Un-paired sampling technique was used in this study, matching was done for age (± 5 years). Every woman in this study was interviewed by one researcher and the following questions were answered in addition to the specific prior anthropometric measurements. The presence of one or more of the chronic non-communicable diseases, previous history of any surgical operation and social class was obtained according to occupational social classification [13] were all included in the questionnaire form. Prepare for this study, socio-economic factors were obtained according to the following [13]:

Social factors in health and Disease:

I – Personal characteristics:

A- Social identity:

Not modifiable: age, sex and heredity (family history of obesity in primary relatives)
Modifiable as marital status, occupation.

B- Personal habits: Lifestyle
Sedentary life style.
Smoking.
Alcohol consumption.
Fatty, calorie and salt rich diets (unhealthy diets)

C- Psychological make-up:
Personality type A
Personality type B

II – Life Events:

A- Stress

B- Social Discontinuities:
Death of spouse
Change in marital status (single, recent marriage, divorce, death of husband)
Retirement
Change in the job
Change of residence
The born of new baby

C- Geographical mobility:
- Rural to urban, urban to rural of any type.

D- Catastrophic events.

III – Social Context:

A- Economic factors:
- Unemployment.
- Very high employment
- Sudden job descend.
- Sudden loss of huge money.

B- Social disintegration
- Living alone, or with family

C- Urbanization:
- Urban or rural
- Crowding index

Odd ratio (OR) was calculated with its 95 per cent confidence interval (95% C.I.). P-value less than or equal to 0.05 was considered significant.

Results:

The mean ages of the study population was 56.2 years for cases and 57.1 years for controls. The results of examining social risk factors in the development of obesity appeared as the following:

Table (1) depicts personal characteristics of the study sample and their mode of association with obesity. Positive family history is more prevalent among cases than controls in a very highly significant way (P= 0.000) and the presence of such history appeared to be associated with the development of obesity (OR= 6.68 and 95%C.I. = 3.45-12.94). Sedentary life carried a highly significant operational role in the occurrence of obesity (OR= 7.19, P-value=0.000 and 95%C.I. = 4.11-12.59). Similarly, unhealthy dietary behavior and personality type B, each increases the risk of developing obesity in a very highly significant way (OR= 7.87, P-value=0.000 and 95%C.I. = 4.58-13.51), (OR= 5.15, P-value=0.000and 95%C.I. = 0.11-0.34), respectively. Marital status and active smoking showed no significant differences between cases and controls.

Previous history of social discontinuities carries a significant risk for the development of obesity (OR= 2.25, P-value= 0.008, and

95%C.I. = 1.24-4.08). While occurrence of stress among the family, geographical mobility and catastrophic life events played no significant role, **Table (2).**

Table (1): Association of personal characteristics and the development of obesity in the present study

Characteristics	Cases (n=125)		Controls (n= 125)		O R	P-value*	95 % C.I.
	No.	%	No.	%			
Positive family history	49	39.2	11	8.8	6.68	0.000	3.45-12.94
Abnormal marital status	33	26.4	24	19.2	1.51	0.175	0.83-2.74
Sedentary life	74	59.2	21	16.8	7.19	0.000	4.11-12.59
Active smoking	7	5.6	15	12	0.44	0.074	0.18-1.08
Unhealthy dietary behavior	96	76.8	37	29.6	7.87	0.0000	4.58-13.51
Personality type B	107	85.6	67	53.6	5.15	0.000	2.86-10.56

- Chi square test for contingency table was sued.

Table (2): Association of life events and the development of obesity in the present study

Life events	Cases (n=125)		Controls (n=125)		OR	P-value*	95% C.I.
	No.	%	No.	%			
Stress	44	27.2	34	35.2	1.45	0.172	0.85-2.47
Social discontinuities	39	31.2	21	16.8	2.25	0.008	1.24-4.08
Geographical mobility	8	6.4	9	7.2	0.88	0.802	0.32-2.39
Catastrophic	19	15.2	11	8.8	1.86	0.119	0.85-4.06

* Chi square test for contingency table was sued

Factors related to social context of the study subjects showed no significant association with obesity, **Table (3).**

Table (4) portrays the association of certain medical and obstetrical variables with obesity. Presence of CNCDs is associated with obesity in a highly significant manner (P=0.000), also the value of OR indicates the presence of operational risk for development of obesity (OR=4.43, 95% C.I. = 2.51-7.80). Previous abdominal surgical procedures also played an assumed significant operational role (OR= 3.55, P-value= 0.0001, 95%C.I. = 1.65-7.64). Moreover, multiparty (in Para 4 +) seemed to be risky in highly significant way (OR=2.23, P-value=0.004, 95% C.I. = 0.26-0.78).

A woman belongs to social class III, carries a significant risk of developing obesity (OR= 1.79, P-value= 0.022, 95%C.I. = 1.09-2.95). While woman in social class V carries an assumed protection that is reaching a significant level (OR= 1.79, P-value= 0.022, 95%C.I. = 1.09-2.95).

Table (3): Association of social context and the development of obesity in the present study

Social context	Cases (n=125)		Controls (n=125)		OR	P-value*	95% C.I.
	No.	%	No.	%			
Economic factor	6	4.8	11	8.8	0.52	0.209	0.19-1.44
Social disintegration	1	0.8	2	1.6	0.50	0.561	0.05-5.19
Urbanization	92	73.6	85	68	1.31	0.330	0.76-2.26
> 8 persons / household	16	12.8	28	22.4	0.51	0.046	0.26-0.99

* Chi square test for contingency table was sued

Table (4): Association of other variables with the development of obesity in the present study

Variables	Cases (n=125)		Controls (n=125)		OR	P-value*	95% C.I.
	No.	%	No.	%			
CNCDs	59	47.2	21	16.8	4.43	0.000	2.51-7.80
Previous abdominal op	27	21.6	9	7.2	3.55	0.001	1.65-7.64
> 2 abortions	22	17.6	14	11.2	1.69	0.150	0.83-3.45
> 4 parity	49	39.2	28	22.4	2.23	0.004	0.26-0.78

* Chi square test for contingency table was sued

Table (5): Distribution of the study population according to occupational social classification

Social class	Cases (n=125)		Controls (n=125)		OR	P-value*	95% C.I.
	No.	%	No.	%			
I	9	7.2	12	9.6	0.73	0.494	0.30-1.80
II	11	8.8	13	10.4	0.83	0.668	0.35-1.94
III	67	53.6	49	39.2	1.79	0.022	1.09-2.95
IV	30	24	28	22.4	1.09	0.764	0.62-1.91
V	8	6.4	23	18.4	0.30	0.004	0.13-0.68

- Chi square test for contingency table was sued

Discussion:

Obesity is a term used to indicate excessive deposition of fat in the body. It is the most common nutritional disorder in the developed countries and is assuming a significant proportion in the developing countries[14]. It has long been observed that obesity is associated with an increased prevalence of morbidity and reduced life expectancy. Even Hippocrates is reported to have said that "sudden death is more common in those who are naturally fat than in the lean" [15]. The etiology of obesity is complex and multi-factorial and both genetic and environmental factors play an important role in its development. It tends to concentrate in families, though no specific pattern of inheritance has been observed [16, 17].

In this work, the age prevalence among the study population is out of estimation, since as has been put in methodology, matching of control was on the basis of ± 5 years. Moreover, in this type of study (case-control), the prevalence of the disease can not be estimated. The same thing was applied on sex, because all cases and controls were women. As a natural part of the obesity epidemic, the number of overweight and obese women of childbearing age is increasing, as is the number of overweight or obese women at the time of booking maternal health care at the beginning of pregnancy [18-21]. Many studies emphasize the importance of a pre-pregnancy weight within a normal range, and show links between pre-pregnancy overweight or obesity and pregnancy and/or labor complications, including a higher risk for caesarean delivery, pre-eclampsia and gestational diabetes [22,23]; especially if they have gestational diabetes or a pre-pregnancy metabolic syndrome, indicated by a high level of serum insulin, a high blood level of low-density lipoprotein (LDL) cholesterol, a low level of high-density lipoprotein (HDL) cholesterol and a high gestational weight gain [24,25].

Inheritance could mediate the relationship between socioeconomic status and obesity. Previous studies have shown that obesity is a heritable trait, at least in part [26, 27], and a genetic component appears to underlie socioeconomic differences as measured by educational attainment [28, 29, 30]. Although understanding these genetic influences is important, their discussion is beyond the scope of this work. The result of the present study regarding positive family history goes in consistence with the above conclusions, where it is found to be highly and significantly associated with the development of obesity(P=0.000).

Physical inactivity refers to low levels or the absence of physical activity. It represents the lower end of the activity spectrum. Sedentary behavior includes a number of occupations that have in common too little energy expenditure. Watching television or videos – that is, time spent in front of a screen or, more generally, time spent sitting daily – is a commonly used indicator of sedentary behavior [31]. A sedentary lifestyle may include one or more weekly sessions of intentional exercise, which may be more common among people with more education. Thus, sedentary behavior does not represent the opposite of physical activity, but corresponds to a complementary dimension of behavior. The distinction between physical activity and sedentary behavior has implications for both assessing and preventing obesity and related diseases. In the current study, sedentary life style is found to be highly associated with the occurrence of obesity in women. Similar results were also obtained by many other studies worldwide [32, 33, 34, 35].

In recent years, new statistical approaches have sought to define the overall nutritional features of the diet. Some dietary patterns can be linked to weight change; those characterized by food high in fat, salt or sugar (unhealthy dietary behavior) and relatively low in fiber have been associated with greater weight gain[36, 37]. Similar convincing results were obtained from this study. Unhealthy dietary behavior was found to be associated with greater significant risk in developing obesity (OR= 7.87, P-value=0.000 and 95%C.I. = 4.58-13.51).

Personality type A, nowadays is widely believed to be among the main and leading causes for ischemic heart disease [13]. Although, obesity, in general among risk factors in the development of ischemic heart disease, the association in this study is found to be very significant between obesity and personality type B (OR= 7.87, P-value=0.000 and 95%C.I.= 4.58-13.51). This make obese individual at the midway in the course of developing ischemic heart problems. Results of this study in regard to this issue go in reliance with results of Susan and Jack [38]. These results are very important from the preventive point of view, that is all obese individuals should be among the targeted personnel, but those obese with personality type A are most serious ones.

Many studies indicated that obese individuals drink more alcohol and smoke more cigarettes [39, 40]. In this work, no association was found between obesity and smoking. Moreover non of cases and controls reported alcohol drinking. This can be

explained because the sample of this study consisted of women and in our Islamic Eastern societies these two habits (alcohol drinking and cigarette smoking) are both religiously sanctioned and socially unacceptable for women.

Studies of stress as a risk factor for obesity are limited. Hass et al [41] included a stress index in their study of weight gain among women in their late reproductive years (ages 35–47). Three hundred and thirty-six women were followed for four years. A 14-item Perceived Stress Scale was used to assess the degree to which situations were stressful to the subject. Women who gained more than ten pounds were not different in regard to this stress measure than other subjects. The same conclusion can be withdrawn from the present study regarding stress. More geographical mobilites and catastrophic events, in this work, were also found to be not associated with the development of obesity. On the opposite, social discontinuities found to be significantly associated with the occurrence of obesity (P=0.008). Haas et al, in their study also found that social discontinuities are among the main risk factors in the process of developing obesity among women in childbearing ages [41].

Sudden change in economic conditions, social disintegration and urbanization in this work, all are found to be not among risk factors for obesity among women. The same findings were obtained from the work of Kumanyika [42]. Overcrowding was found to have significant protection against obesity among women in this research and this can be justified because women in overcrowded households may not have enough access to food. Martin Guilford found in his study reported a paradoxical results and concluded that women in an overcrowded households have more access to food. This controversy can be explained according to the differences in culture, behaviors and attitudes in both Eastern and Western societies [13].

The presence of one or more of chronic non-communicable diseases appeared in this work to be significantly connected with the development of obesity. Cihangir et al [44] also found a comparable results in their work in Turkey. Obesity per se is a known risk factors for the majority of chronic non-communicable diseases and vise versa. Thus, there is eventually a vicious circle between obesity and those diseases and the prevention of obesity, from the previous outcomes, appears to be of prime importance in the way of maintaining good health for women. Moreover, previous abdominal operations in this study showed a clear and important risk for obesity, meticulous search was performed in published studies for this issue, but no similar study was found. Alessandra et al [45] found in their study in Brazil, after multivariate adjustment, women with 3 childbirths and more have three times risk to be overweight than those women with less than three (OR=3.4;95% CI=1.2-9.6). Similar result was found in present work, where women with more than 4 child appeared to be significantly at higher risk of developing obesity (OR=2.23, P-value=0.004, 95% C.I. = 0.26-0.78)...

Many studies proved that obesity in most Western societies is more prevalent in lower social classes and in most Eastern societies is more prevalent in more affluent classes. In this work, social class III (professional manual and non-manual worker) appeared to be significantly associated with the development of obesity. In the contrary, social class V (non-professional worker) emerged in this study as a significant protecting factor against the occurrence of obesity. Similar results were obtained from other two studies [44, 45], and this, approved that different societies have different cultures and thus, different prevalence and incidence for diseases can be anticipated for them.

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