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Prevalence and Risk Factors of Obesity among Elderly attending Geriatric Outpatient Clinics in Mansoura City

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Abstract

Obesity is a major public health problem affecting all ages in both developed and developing countries. It is considered the fifth leading risk factor for deaths all over the world as about 2.8 million people die due to obesity each year directly or indirectly. Obesity in elderly is considered one of the most serious public health challenges for all over the world. It is a complex; multifactorial disease arises from the interactions between genetic, environmental and behavioral factors together with other factors results in energy imbalance and promotes excessive fat deposition. **Aim:** to Determine Prevalence and Risk Factors of Obesity among Elderly attending Geriatric Outpatient Clinics in Mansoura City. **Method:** Descriptive, analytical, cross sectional hospital based research design was used. The study carried out on 126 elderly attending Geriatric outpatient clinics in the specialized medical hospital and general hospital in Mansoura City. Data was collected using 3 tools, socio-demographic and clinical data structured interview sheet, Health promoting Lifestyle profile II (HPLPII), Body Mass Index. **Results:** The results indicate that the prevalence of obesity among elderly attending Geriatric Outpatient Clinics in Mansoura City was 33.3% and there was significant relation between positive family history of obesity, unhealthy lifestyle as poor nutritional habits, and lack of physical activity, poor stress management and obesity. **Conclusion:** Increase awareness about obesity and healthy lifestyle is essential for elderly to prevent obesity and its complications.

Keywords: Obesity, Elderly, Risk Factors, prevalence, Lifestyle

Introduction

Improvements in health care have contributed to a significant increase in life expectancy and have influenced growth of the elderly population. This increase is accompanied by a similar rise in the occurrence of age- and nutrition-associated diseases including obesity, cardiovascular disease, and diabetes mellitus (Westendorp 2006). Obesity is defined as abnormal or excessive fat accumulation with a BMI of 30 kg /m2 or more that represents a risk to health (Han &Bchir 2013).

Obesity is a complex, multifactorial disease. It arises from the interactions between genetic, environmental and behavioral factors together with other factors results in energy imbalance and promotes excessive fat deposition (Farooqi et al. 2010).

Over the past several decades, the proportion of obese elderly increased. Obesity is now recognized as the most prevalent metabolic disease world-wide, reaching epidemic proportions in both developed and developing countries and affecting all age group. (Michalakis et al. 2013).

According to the estimates of the World Health Organization (WHO), Prevalence of overweight and obesity reaches 1.4 billion people worldwide, obesity alone covering over 10% of world population. Furthermore, overweight and obesity is the fifth risk factor for mortality worldwide, causing approximately 2.8 million deaths per year (WHO 2013).

It was estimated that the prevalence of obesity in elderly Americans, aged 60 years and older is 37.4%. While 25% of Australians aged 65–74 years and 14.4% over 75 years were obese. In the United Kingdom, nearly 25% of women and 18% of men aged 65–75 years and 22% of women and 12% of men aged 75 years or older suffering from overweight or obesity (Elisabeth et al. 2012; Dutra et al. 2013).

In Nursing homes, 30% of elderly aged 65 years and older within the nursing homes were obese while 15– 20% of residents aged 65– 74 years are obese In general, Prevalence of obesity in the Middle Eastern countries has reached to an alarming rates among all age groups as Prevalence of obesity in Bahrain 37.9%, Jordan 37.9%and Lebanon 27.4% .While, In Saudi 15.75% of elderly aged 60 years and more are obese . On the other hand, In Egypt 2006, the prevalence of Overweight and obesity among elderly in rural population is 62.3%. (Mahfouz et al. 2006; Musaiger 2011).

Materials and Method

Study design: Descriptive, cross sectional hospital based research design was used in this study. **Setting:** The study was carried out at Geriatric outpatient clinics of the specialized medical hospitaland Mansoura general hospital.

Subjects:

The study subjects was comprised all elderly of both sexes (male and female) that attending the study settings. The patients had been selected according to the following criteria: age 60 years and above, able to communicate; accept to participate in the study, Available at the time of data collection. A Sample size was calculated based on the percentage of obesity/ overweight among general population 56.2% (Reappraisal of prevalence of obesity in Egyptian village in Dakahlia, Hassan 2006) and percentage of obesity / overweight among elderly 44.6 % (A Study of Obesity Among Elderly in Alexandria , Mahmud 1993).for calculating sample size we used website www.Dssresearch.com assessed on 8 June 2014 using the previous percentage , two tailed significance test with a power 80% and alpha error 5% . The calculated sample size is 113 we add 10 % for any error in data calculation, so we will conduct our study on 126 patients.

Study tools: In order to collect the necessary information for the study three tools were used to collect the necessary data.

Tool I: Socio-demographic and clinical data structured interview schedule sheet:

It was developed by the researcher after literature review and consisted of: Socio demographic characteristics of the elderly such as age, Sex, marital status, level of education, occupation before retirement, income, Health status of elderly, Medication used and smoking.

Tool II: Health Promoting Lifestyle Profile II (HPLPII) :

Health promoting lifestyle profile II (HPLP II) developed by Walker 1995 (Walker et al.1995), and translated into Arabic and tested for its validity and reliability by (Abd El-Hameed 2011). The reliability was assured by Spearman's correlation coefficient r = 0.886. It was used to measure respondents' healthy lifestyles through six subscales (8-9 items for each) that measure the dimensions of a health promoting lifestyle; it includes: health responsibility, nutritional habits, physical activity, spiritual growth, interpersonal relations, and stress management. The total number of items is 52. The HPLP II is a summated behavior-rating scale. It uses a 4-point ordinal response format to measure frequency of self-reported health promotion behavior. Each item had four possible responses: 1 (never), 2 (sometimes), 3 (often), and 4 (routinely). A score for overall health promoting lifestyle behaviors was obtained by calculating a mean of the individual's responses to all 52 items: Six subscale scores were obtained similarly by calculating a mean of the responses to each subscale items. Therefore, each of the six subscales score could range from 1to 4, and the total score ranges from 6 to 24 (Walker et al.1995).

Tool III: Body mass index calculation:

It was done by the researcher for measuring body mass index by divided weight on height. Obesity will be considered if BMI 30 and more a s proposed by WHO (WHO, 2004). Collected cases were classified according to (WHO 2004) to Underweight (<18.5), Normal range (18.5-24.9), Overweight (25.0-29.9), Obese class I (30.0-34.9), Obese class II(35.0-39.9) , Obese class III (≥40).

Method

1. Official letters were issued from the Faculty of Nursing, Mansoura University to the directors of study settings to obtain approval to carry out the study.
2. After a thorough review of literature, tool I was developed by the researcher and reviewed by the supervisors
3. Tool II was validated by (Abd El-hameed 2011). The reliability was assured by Spearman's correlation Coefficient r was r = 0. 86.
4. Assessment of weight and height will be calculated for Body Mass Index.
5. The tools were tested for its content validity by a jury of 9 experts in the related fields.
6. A pilot study was conducted on 12 elderly from the Geriatric outpatient clinic at the Specialized Medical Hospital in order to evaluate the clarity and applicability of the study tools.
7. The researcher used to meet with each elderly in the waiting room in outpatient clinics or inside outpatient clinics. A face to face interview was conducted with each elderly who fulfilled the study criteria.
8. Privacy of the study sample and confidentiality of the collected data were assured.

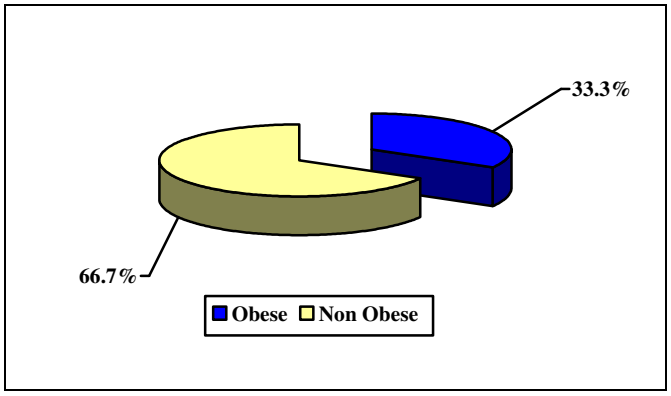
9. Each elderly was interviewed individually by the researcher after the researcher introducing herself and explaining the purpose of the study. Then the necessary data were collected using the study tools. Patients' medical records were reviewed to complete the part of patient's health history and the rest of questions was completed by the family caregiver.
10. The weight was obtained for each elderly using a bathroom type scale, and the height was measured using a measuring tape.
11. The body mass index (BMI) was then calculated using the following equation: BMI= weight (kg)/ height 2 (m).
12. The data collection covered a period of three months from the first of February, 2015 till the first of April, 2015.

Statistical analysis

After data were collected it was revised, coded and fed to statistical software IBM SPSS version 16. The given graphs were constructed using Microsoft excel software. All statistical analysis was done using two tailed tests and alpha error of 0.05. P value less than or equal to 0.05 was considered to be statistically significant. P value was calculated after adjustment of multiple comparisons using Benferoni correction technique.

Results

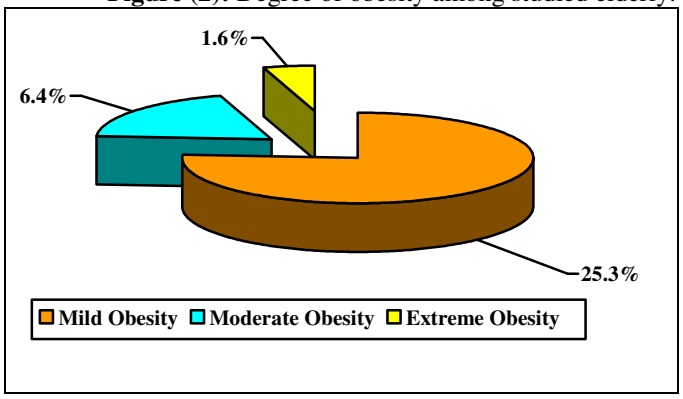
Figure (1): Prevalence of obesity among studied elderly.



N= 126

Figure 1 shows prevelance of obesity among studied elderly was 33.3%.

Figure (2): Degree of obesity among studied elderly.



N= 126

Figure 2: shows prevelance of mild obesity among studied elderly was 25.3%, moderate obesity was 6.4% and extreme obesity was 1.6%.

Table (1): Relation between BMI (Body Mass Index) and Socio demographic data among the studied elderly.

Items	BMI		Test of Sig.
	N	Mean ± SD	
Age (in years)			
60-	118	28.8953 ± 5.21493	F=6.198
75-	6	23.7500 ± 0.57533	P= 0.003*
85+	2	19.3500 ± 2.05061	
Sex			
Male	50	27.4160 ±3.85335	t=1.959
Female	75	29.2899 ± 5.98290	P= 0.052*
Marital Status			
Single	5	28.0800 ± 5.46416	F=1.710
Married	70	29.1114 ± 4.94883	P= 0.169
Widow	46	27.2813 ± 5.72313	
Divorced	5	31.5400 ± 4.58726	
Residence			
Rural	65	27.8698 ± 4.83402	t=1.171
Urban	59	28.9797 ± 5.71739	P= 0.244
Level of Education			
Illiterate	41	27.4551 ± 5.68651	
Read and write	41	28.4293 ± 5.22840	F= 1.530
Preparatory& primary	27	29.9178 ± 5.60274	P= 0.186
Diplome	14	30.0929 ± 2.71221	
High education	3	23.2000 ± 0.00000	
Occupation before Retirement			
Housewife	55	34.6000 ± 0.28284	
Employee	36	28.7464 ± 6.11878	
Commercial	6	29.6772 ± 5.18776	F= 1.750
Technical	6	28.6333 ± 4.10057	P= 0.104
Manual	9	27.1833 ± 4.08970	
Farmer	12	26.3333 ± 2.87141	
Teacher	2	24.9750 ± 2.26279	
Income			
Enough	62	29.6110 ± 5.54491	F= 5.576
Not enough	64	27.4212 ± 4.85092	P= 0.020*

t= independent sample test F= one way ANOVA test

Table (1) describes relation between elderly socio demographic characteristics and mean score of total BMI. The mean BMI score decreases with age. Elderly aged 60 to less than 75 years had higher mean BMI score (X=28.8953 ± 5.21493) while elderly aged 85 years or more had lower mean BMI score. There is statistical significant relation was found between age and mean score of BMI (F=6.198, P= 0.003). The table show that there is statistical significant relation between sex and mean score of BMI (T=1.959, P= 0.052) as female had mean BMI score (X= 29.2899 ± 5.98290) higher than male (X= 27.4160 ±3.85335). The table also revealed that there is no statistical significant relation was found between mean BMI score and elderly Marital Status, Residence, Level of Education, Occupation before Retirement (F=1.71, T=1.171, F=1.530 and F=2.404 respectively) and (P= 0.169, P=0.244, P= 0.186 and P= 0.104 respectively). In relation to income, the table shows that elderly who had enough income had higher mean BMI score (X= 29.6110 ± 5.54491) while elderly who had not enough income had lower mean BMI score (27.4212 ± 4.85092), so there is significant difference between income and mean BMI score (F=5.576 , P= 0.020).

Table (2): - Relation between BMI (Body Mass Index) and Medical history of the studied elderly.

Medical History	BMI						MCP
	Normal		Overweight		Obese		
	No	%	No	%	No	%	
Hypertension							
Yes	23	30.7	21	28.0	31	41.3	0.040*
No	23	46.0	17	34.0	10	20.0	
Hyperlipidemia							
Yes	7	20.0	7	20.0	21	60.0	0.001*
No	39	43.3	31	34.4	20	22.2	
Diabetes mellitus							
Yes	14	24.1	20	34.5	25	42.4	0.021*
No	32	47.8	18	26.9	16	24.2	
Cardiac disease							
Yes	4	14.8	5	18.5	19	67.9	0.001*
No	42	42.9	33	33.7	22	22.7	

MCP: Mont Carlo exact probability * P < 0.05 (significant)

In table (2) regarding the medical history, it was reported that 41.3% of hypertensive elderly were obese. While 60% of elderly suffering from Hyperlipidemia were obese. 42.4 % of obese elderly had diabetes mellitus. As regards Cardiac disease it was present 67.9 % of obese elderly.

Table (3):- Relation between BMI (Body Mass Index) and medication consumed by the studied elderly:

Medications Consumed #	BMI						MCP
	Normal		Overweight		Obese		
	No	%	No	%	No	%	
Diabetic Medications							
Yes	14	24.1	20	34.5	25	42.4	0.021*
No	32	47.8	18	26.9	16	24.2	
Antihistamine							
Yes	1	10.0	1	10.0	8	80.0	0.004*
No	45	39.1	37	32.2	33	28.7	
Corticosteroid							
Yes	2	12.5	1	6.3	13	81.3	0.001*
No	44	40.4	37	33.9	28	25.7	
Anti-Hypertensive Medications							
Yes	23	29.1	21	28.0	31	41.3	0.040*
No	23	50.0	17	34.0	10	20.0	
Cardiac medications							
Yes	4	14.8	5	18.5	19	67.9	0.001*
No	42	42.9	33	33.7	22	22.7	
Anti - Hyperlipidemic Medications							
Yes	7	20.0	7	20.0	21	60.0	0.001*
No	39	43.3	31	34.4	20	22.2	

MCP: Mont Carlo exact probability * P < 0.05 (significant) # More than one response

In table (3), regarding Medication consumed by the studied elderly, it was reported that 41.3 % of obese elderly used antihypertensive medications while using antihyperlipidemic medication was reported by 60 % of obese elderly. As regards cardiac medications. It was noticed that 67.9 % of obese elderly used cardiac medications. On the other hand, about 81.3 % of obese elderly used Corticosteroid. Moreover, Antihistamine drugs were used by 80 % of obese elderly.

Table (4): Distribution of studied elderly according to their lifestyle patterns

Lifestyle items	No = 126				Mean ± SD =
	Practicing behavior		Not Practicing behavior		
	No =	%	No =	%	
Health Responsibility	55	43.7	71	56.3	2.15 ± 0.57
Nutritional Habits	59	46.8	67	53.2	2.5 ± 0.38
Physical activity	58	46.0	68	54.0	2.0 ± 0.6
Spiritual growth	57	45.2	69	54.8	2.4 ± 0.51
Interpersonal relations	61	48.4	65	51.6	2.1 ± 0.52
Stress management	62	49.2	64	50.8	2.3 ± 0.67

Practicing behaviors (Positive response) = mean of individual's responses to each subscale ≥ 2.5.
Not practicing behaviors (Negative response) = mean of individual's responses to each subscale ≤ 2.5.

Table (4): Regarding health responsibility, 56.3 % of the participants assume Negative responsibility towards their health while it appears from this table that 53.2 % of studied elderly not participating in any physical activity. Concerning to the nutritional habits, it was found that 54% of the participant consume unhealthy diet. Regarding to Interpersonal relations and spiritual growth were practiced negatively by 54.8 % of the studied elderly and 50.8 % respectively. In relation to stress management, 51.6% of the studied elderly have negative response toward stress management.

Table (5):- Relation between BMI (Body Mass Index) and Lifestyle pattern of the studied elderly.

Items	BMI						X2 (P)
	Normal		Overweight		Obese		
	No	%	No	%	No	%	
Health Responsibility							12.6
Practicing behavior	27	58.7	19	50.0	9	22.0	(0.002)*
Not Practicing behavior	19	41.3	19	50.0	32	78.0	
Physical activity							39.2
Practicing behavior	32	69.6	24	63.2	3	7.3	(0.001)*
Not Practicing behavior	14	30.4	14	36.8	38	92.7	
Nutritional Habits							59.1
Practicing behavior	39	84.8	18	47.4	1	2.4	(0.001)*
Not Practicing behavior	7	15.2	20	52.6	40	97.6	
Spiritual growth							42.9
Practicing behavior	38	82.6	19	50.0	5	12.2	(0.001)*
Not Practicing behavior	8	17.4	19	50.0	36	87.8	
Interpersonal relations							35.6
Practicing behavior	35	76.1	17	44.7	5	12.2	(0.001)*
Not Practicing behavior	11	23.9	21	55.3	36	87.8	
Stress management							41.6
Practicing behavior	36	78.3	21	55.3	4	9.8	(0.001)*
Not Practicing behavior	10	21.7	17	44.7	37	90.2	

* $P < 0.05$ (significant)

Table (5): According to this table, there is a significant relation between BMI and life style pattern domains of the studied elderly. There are significant relation between obesity and practicing health responsibility of the studied elderly as 22 % of obese elderly assume positive responsibility towards their health. It appears from this table that there is significant relation between practicing physical activity and obesity as 7.3 % of obese elderly who participating in any physical activity. On the other hand, it was found that there is a significant relation between consuming healthy diet and obesity as 2.4% only of obese elderly consume healthy diet. Concerning to spiritual growth, this table shows that there is significant relation between spiritual growth and body mass index as 12.2 % of obese elderly had positive spiritual growth. Regarding to Interpersonal relations, This table shows that there is significant relation between interpersonal relations and obesity as only 12.2% of obese elderly practicing positive behavior toward interpersonal relations. In relation to stress management, according to this table there is a significant relation between negative management of stress and obesity as 90.2 % of the obese elderly have negative response toward stress management.

Table (6):- Relation between BMI (Body Mass Index) and family history of obesity among the studied elderly.

Family history	**BMI**						MCP
	Normal		Overweight		Obese		0.001*
	No	%	No	%	No	%	
Positive family history	12	20.0	18	30.0	30	50.0	
Negative family history	34	52.3	20	30.8	11	16.9	

MCP: Mont Carlo exact probability * P < 0.05 (significant)

Table (6): Illustrate the Family history of obesity among the studied elderly. It appears that 50% of obese elderly had positive family history of obesity compared to only 20 % of elderly with normal weight. There was statistically significant difference between both groups (P = 0.001).

Table (7):- Relation between BMI (Body Mass Index) and smoking as risk behavior among the studied elderly.

Smoking	BMI						MCP
	Normal		**Overweight**		**Obese**		0.001*
	No	%	No	%	No	%	
Current smoker	12	38.7	14	45.2	5	16.1	
Non smoker	34	38.6	23	26.1	31	35.2	
Ex-Smoker	0	0.0	1	16.7	5	83.3	

MCP: Mont Carlo exact probability * P < 0.05 (significant)

Table (7) represents Relation between BMI and smoking as risk behavior among the studied elderly. 83.3 % of obese elderly are ex-smoker compared to none of the studied elderly with normal weight is ex-smoker. The difference between both groups is statistically significant (P = 0.001).

Discussion

Nowadays, Obesity in elderly is considered one of the most serious public health challenges for all over the world as prevalence of obesity in elderly is increasing worldwide at an alarming rate affecting both developed and developing countries. About one billion people all over the world are overweight and at least 300 million are clinically obese. It is considered a major contributing factor to the global burden of chronic disease and disability (Thanh 2008; Douketis et al. 2012).

The present study revealed that the prevalence rate of obesity in elderly who attended geriatric outpatient Clinics in Mansoura City was 33.3 % (based on the WHO criteria for defining obesity). This result is slightly higher than the result of other study conducted in rural Community in Minia in Egypt by (Mahfouz et al. 2006) which was 28.3 %. While In a study conducted by (Jackson et al.2014) in England, the prevalence of obesity was reported to be 31.1%. Variation in rates may be attributed to the difference in sample size, mean age of the participants, health condition, drugs used and type of food consumed, lack of exercise, socioeconomic status, and other confounders for obesity.

Regarding gender difference, in this study the majority of obese elderly were female .The same observation was reported from another study conducted by(Kumah et al. 2015) who reported that prevalence of obesity in female 60% higher than male .

The present study revealed that the rate of obesity is significantly decrease with advancing age. This result agreed with (Binu & Harnagle 2014). Also a study done by (Leahy et al. 2014) reported the same results .

Regarding elderly level of education, the present study revealed that there was insignificant relation between elderly level of education and obesity while (Sabanayagam et al. 2009) found that low educational level is a risk factor for obesity .

The present study revealed that there is no statistical significant relation was found between mean BMI score and elderly Residence. This result in line with the study of (Faeh et al. 2007) which revealed that there was no difference in the prevalence of obesity between urban and rural elderly of 10 European countries, which

may be indicative of similar socioeconomics in both urban and rural areas of these countries.

When studying the relation between the occupation of the elderly before retirement and occurrence of obesity, the present study revealed that there is no significant relationship between obesity and occupation before retirement . This result agreed with (Nematy et al.2009) who found that there is no significant relationship between obesity and employment status (p = 0.59) . Also another study conducted by (Binu & Harnagle 2014) reported the same results.

Considering income, this study revealed that there is significant difference between income and mean BMI score. The same results reported by (Newman et al.2011) and study conducted by (Dinsa et al.2012) found that the elderly on higher income were at risk of overweight and obesity. This may be due to with increase income people have poor sedentary lifestyle as eating high fat food , fast food and decrease physical activity that lead to weight gain.

Unexpectedly, the result of the present study showed that there was no statistical significant relation between mean BMI score and elderly Marital Status. This result in accordance with the study done by (Wilson 2012) who reported that There was no association between BMI and marital status in Irish elderly. Moreover, the study of (Abdulkareem 2013) in Saudi stated that There was no association between obesity and marital status (p=0.135).

The present study showed that smoking cessation increase risk of obesity and weight gain. The same results were reported by (Clair et al. 2013) in which Most smokers who quit experience a weight gain .In Addition to that, the study of (Tian et al. 2015) showed that there is a strong relation between smoking cessation and weight gain and the study of & the study of revealed that there is a significant relation between smoking cessation and weight gain .

Positive Family history is considered a main predictor for obesity (Bouchard et al. 2007).The current study stated that half of elderly with positive family history was obese. This result is similar to (Patnaik et al. 2011) stated that increase the risk of overweight and obesity among individuals with positive family history of obesity. At the same way, (Badawi et al. 2012) in Port Said , Egypt mentioned that positive family history of overweight and/or obesity were significantly associated with high BMI (p <0.001).

Undoubtedly, The present study showed that there was significant relation between obesity and hypertension .The same result was reported by the study of (Shekharappa K et al. 2011) who revealed that there was a statistically significant increase in heart rate, systolic blood pressure and diastolic blood pressure in obese subjects when compared to non-obese in all age group.

The present study showed that there was significant relation between obesity and Hyperlipidemia. The same result was found by (Giurgiu & Bardac 2013) in which there was significant relation between increased BMI and occurrence of Hyperlipidemia (P= 0.001).

Regarding the relation between obesity and Diabetes Mellitus, the result of the present study showed that there was a significant relation between obesity and diabetes mellitus. This result in line with a study done by (Yaturu 2011)in which Increase in BMI is a better predictor of diabetes than increase in weight. In the same way , the study conducted by Neeland I et al ., (2012) that revealed that There was a close association between obesity and type 2 diabetes as seven times greater risk of diabetes in obese people compared to those of healthy weight.

The results of the present study showed that there is a significant relation between obesity and cardiovascular diseases. This result is consistent with other studies (Bastien et al. 2014) which found that Obesity is recognized as an independent risk factor for cardiovascular (CVD) diseases and is also strongly associated with other major CVD risk factors such as hypertension, high cholesterol and insulin resistance.

The present study showed that there was significant relation between using corticosteroid and increase BMI. This result is consistent with a study done by (Huscher et al. 2009) which indicated that the rate of weight gain increase linearly with increase dose of corticosteroids.

As well, the present study revealed that there was significant relation between using antihistamine medications and increase BMI. The same result was reported by a study by (Joseph et al. 2010) in which using antihistamine drugs had significantly higher weight (p< .001), BMI (p< .001) than others . This results can be explained by direct effect of antihistamine drugs on appetite stimulation and increased sedation effect that lead to a decreased energy expenditure and weight gain (Janiszewski 2015).

Unhealthy Lifestyle pattern is a major risk factors for obesity (Sikorski et al. 2014). Accordingly, about Three quarter of the obese elderly in the current study had negative concept towards their health responsibility . This may be related to the perception of elderly about their health where most of them consider themselves healthy till the onset of signs or symptoms of the disease. This supports the findings of other studies conducted

in Egypt, Alexandria by (Hassan 2009) and (Alkhayyal 2010) who reported that only one third of elders maintain regular follow up visits.

Physical exercise is an important risk factor for obesity. Decreased physical activity lead to decreased energy expenditure with ageing causing increase in fat accumulation in body (Binu & Harnagle 2014) .The present study showed that there was a significant relationship between obesity and physical inactivity .This result is consistent with study done by (Mushtaq et al. 2011) reported that Physical activity more than twice a week had a significant relationship with overweight and BMI as it increases energy expenditure (P = 0.001).

The present study showed that there was statistical relation between Consumption of unhealthy diet and total mean score of BMI. The same result reported by (Ezzat et al. 2011) found that there was statistically significant higher differences between the obese and non obese regarding consumption of high energy dense food items. This results in line with the study by (Chaudhry et al. 2012) in which There was statistical significant relation between obesity and eating habits (p = 0.001).

In relation to spiritual growth, this study revealed that there was statistical significant relation between body mass index and spiritual growth . This finding is similar to that of a study conducted by (Sehhatie et al. 2015) who revealed that There was a significant relationship between spiritual growth and body mass index (P<0.001).

Furthermore, the results of the present study showed that there was significant relation between BMI and interpersonal relations. This result may be explained by the fact that obesity decrease body image and self esteem which make individual isolated from his social network .The same results reported by (Kershaw et al. 2014) who found that Persistently high negative interpersonal relations were associated with higher BMI increases . In the same way study done by (Mark & Goodman 2015) revealed that there was significant relation between negative social relationships and increase in BMI.

With regard to relation between stress management and obesity, the present study showed that there was significant relation between stress and increased BMI. This result is in line with a study done by (Groesz et al. 2012) who showed that exposure to acute and chronic stressors increase energy-dense food intake and obesity. Furthermore, this results consistent with previous research on obesity, the study of (Tajik et al. 2015) who observed that Stress was a risk factors in inducing overeating as a form of maladaptive coping in obese people .

Conclusion

Based on findings of the present study, it concluded that that obesity is one of the most common and serious problems with increase its prevalence among elderly. The most important risk factors associated with obesity in the present study were enough income, positive family history of obesity and consumption of certain medications as corticosteroids and sedentary lifestyle as unhealthy nutritional habits, Lack of physical activity, poor stress management.

Recommendations

Based on the results of the study, the following recommendations are suggested:

1. Educational programs for elderly about obesity (causes and risk factors and its complications) and how to maintain normal body weight through providing elderly with clear educational materials (including books, pamphlets, videos).
2. Increase awareness of elderly about the importance of adopting health promoting lifestyle such as consumption of healthy diet, maintaining physical activity, and proper stress management through providing elderly with educational materials as books, pamphlets, videos.
3. In-service training to all nurses and health care providers in hospitals and outpatient clinics to update their knowledge, increase their ability to care for obese elderly patients, and teach patients how to modify their unhealthy lifestyle behaviors.

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