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Effect of Depressive symptoms on Weight among Adults at Al-Najaf Province: A case-control Study

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ABSTRACT

Background: Obesity and major depression disorder are two of the most common diseases in the world. They are also big problems because they have a very strong effect on people's health and well-being, but also because of their high morbidity and mortality rates and socioeconomic effect. Aim of the study: This study to study the association between obesity and depression, and to explore the link between body mass index and socio-demographic characteristics.

Patients and methods: A case-control study utilized a random sample of 300 subjects (100 obese group and 200 normal weight group) attending diabetes and endocrinology center at Al- Najaf province. All subjects have been taken randomly from adult individuals with age range between (18-60) years in Al-Najaf province. The data were collected from October to the February. The obtained data analyzed by Version 28 of the Statistical Package for the Social Sciences (SPSS).

Results: The current study found a significant association between obesity and depression, indicates that those with moderate/severe depression scores are more likely to be obese than those with mild depression or no depression (odds ratio = 2.306 times, 95% CI: 1.360-3.910). With (p = 0.002).

The relationship between obesity and socio-demographic factors, this study found positive association between obesity and exercise (p = 0.001) and family history of obesity (p = 0.037), while the other characteristics were not significant.

Conclusions: The current study concluded that those who had moderate or severe depression symptoms were more likely for developing obesity than those who had a mild or no depression symptoms.

Keywords: Depression, obesity and case-control study.

Article Information

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INTRUDUCTION

Obesity and major depressive disorder are two of the most prevalent health issues globally, and they pose serious challenges from both an individual and societal perspective. Not only that, but these two diseases are becoming increasingly common globally. Strong positive connections between depression and obesity have been identified by epidemiological research ⁽¹⁾. The World Health Organization (WHO) define obesity as" abnormal and excessive fat accumulation in the body that presents a risk to health ⁽²⁾. obesity is commonly measured in terms of body mass index (BMI) more than 30 kg/m^{2 (2)}. Obesity is a multifaceted illness on the biological basis which includes genetic and biological components that are involved in normal body growth, eating habits, adipose energy expenditure, and tissue function ⁽³⁾. According to (WHO) In 2022, 1 in 8 people in the world were living with obesity, about 16% of adults aged 18 years and

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older worldwide were obese in 2022⁽²⁾. An increased risk of metabolic. anxiety. cardiovascular, chronic inflammatory, and some cancers is linked to obesity ⁽⁴⁾. Depression, often known as major depressive disorder or clinical depression, is a mood illness that causes people to be unhappy, hopeless, and uninterested in activities ⁽⁵⁾. There are about 280 million depressed people in the world, which is about 3.8% of the population. This includes 5% of adults (4% of men and 6% of women) and 5.7% of adults over 60 years old ⁽⁶⁾. Depression is about 50% more common among women than among men. Worldwide, more than 10% of pregnant women and women who have just given birth experience depression more than 700 000 people die due to suicide every year $^{(7)}$. The positive links between depressive disorders and obesity has been argued; several research have been shown that depressive symptoms is also a contribute as a risk factor for obesity ⁽⁸⁾. The researcher Faith in (2011) detected obesity and depression associations in 25 studies, of which 15 tested studies "depression a risk factor for obesity" paths and 10 tested "obesity a risk factor for depression" paths ⁽⁹⁾. Although about 80% of the studies reported significant obesityto depression associations (odds ratios 1.0-2.0), while 53% of analyzed studies reported a significant depression-to-obesity positive association [9]. While other studies found no significant association between obesity and depression (10 12).

PATIENTS AND METHODS

A case-control study was conducted in Al-Najaf governorate (Diabetes and endocrinology center) at Al-Sadr Medical City. The study had been conducted from October 2023 until the end of January 2024. The size of the sample comprises 300 subjects (two controls for every case), 100 obese subjects with Body Mass Index (BMI $\geq 30 \ kg/m^2$) as a cases group and 200 normal weight participants with BMI around (18.5-24.9kg/m2) as a control group selected after being matched with (sex and age). All participant from the same geographical area. Sample selected randomly from subjects attending Nutrition and Endocrinology Unit.

Data Collection: Study data has been obtaining by using a questionnaire form that includes three domains.

Socio-demographic characteristics: This includes age, residence, educational level, occupation, economic status, physical activity and family history of obesity.

Anthropometric Measurements: Body Mass Index (BMI): Height and weight were computed to measure the BMI measurement by the equation BMI=weight kg /height m²⁽²⁾.

Beck's depression inventory II: The validated Arabic form of Beck's Depression Inventory-II (BDI-II) was used to measure depression symptoms ⁽¹³⁾. The BDI-II is a self-administered assessment that typically requires 5-10 minutes to complete. The assessment comprises 21 items, each rated on a 4-point scale that ranges from 0 (indicating the absence of symptoms) to 3 (indicating the presence of severe symptoms). The scoring is determined by summing the highest ratings for each of the twenty-one items. The minimum score is zero and the maximum score is 63. A score of zero to thirteen indicates the absence of depression, whereas a score of fourteen to nineteen indicates mild depression. Depression is indicated by scores above 20, with scores ranging from 20-28 indicating moderate depression and scores ranging from 29-63 indicating severe depression. Several studies have investigated the validity and reliability of the BDI-II in various groups and nations. These investigations have consistently found that the BDI-II has good internal consistency (Cronbach's alpha = 0.91) and high test-retest reliability (Pearson r = 0.93)⁽¹⁴⁾.

STATISTICAL ANALYSIS

Version 28 of the Statistical Package for the Social Sciences (SPSS) was used to analyze data. To find the mean, standard deviation, rates, and percentages, descriptive statistics were used. Chisquare, t-test, odds ratio used for analysis.



RESULTS

A total of 300 subjects had been included in this study matched for age and gender the mean age of cases was and controls $(37.1 \pm 10.6 \text{ years}$ vs. $34.6 \pm 11.4 \text{ years}$). Table (1) compares obese subjects and normal weight subjects according to sociodemographic characteristics. An about (71%) of cases and control lives in urban areas. Regarding education level intermediate school and bachelor degree are a highest percentage (28 %) of cases, while the high school or vocational is highest percentage (28 %) of control group (27.5%).

Regarding occupational level, the highest percentage (31.0%) of cases were housewives compared to control individuals (27.5%) who were self-employed. Most cases and controls groups have a moderate- economic level. Regarding exercise (73%) of controls practice physical activity compare (37%) of cases group. Table (2) represents depression indicators for obese and control groups. The results of this study indicates that the indicators "Permission," " Loss of Pleasure," " Guilty feeling," " Punishment feeling," " Self-dislike," "Criterionself," " Changes in sleeping pattern," " Change in appetite " and " Body image " show significant differences between cases and controls (p < 0.05). While other indicators of depression have no significant association between cases and controls (P. value >0.05). In Table 3, the results of this study indicate that those with moderate/severe depression scores are more likely to be obese than those with mild depression or no depression (odds ratio = 2.306times, 95% CI: 1.360-3.910). With p. Value = 0.002.

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demographic characteristics.				
Table (1): The distribution of obese subje	cts and normal	weight subjects	according to s	socio-

		Groups				
			Obese		al weight	P. value
		No.	%	No.	%	
Age	Mean ± SD (Range)	37.1±10.6 (18-57)		34.6±11.4 (18-56)		0.078
	Urban	71	71.0	146	73.0	0.716
Residence	Rural	29	29.0	54	27.0	
	Primary school	15	15.0	42	21.0	
Education	Intermediate school	28	28.0	33	16.5	
	High school or vocational	21	21.0	52	26.0	0.153
	Diploma (institute)	17	17.0	23	11.5	
	Bachelor degree (college)	28	28.0	41	20.5	
Occupation	Government employee	26	26.0	46	23.0	
	Private sector employee	6	6.0	20	10.0	0.331
	Self-employed	21	21.0	55	27.5	

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	Housewife	31	31.0	43	21.5	
	Student	7	7.0	21	10.5	
	Retired	1	1.0	4	2.0	
	Unemployed	8	8.0	11	5.5	
	Low	30	30.0	49	24.5	
Economic	Moderate	56	56.0	126	63.0	0.491
	High	14	14.0	25	12.5	
Exercise -	Yes	37	37.0	148	74.0	0.001
	No	63	63.0	52	26.0	0.001
Family history of obesity	Yes	48	48.0	71	35.5	0.027
	No	52	52.0	129	64.5	0.037

Table (2): The distribution of patients with obesity and control subjects according to depression in indicator.

Groups						
		Case		Control		P. value
		No.	%	No.	%	
	No depression	42	42.0	95	47.5	
Sadnaga	Mild depression	47	47.0	76	38.0	0.472
Sauness	Moderate depression	9	9.0	22	11.0	
	Severe depression	2	2.0	7	3.5	
	No depression	44	44.0	113	56.5	
Downiagion	Mild depression	48	48.0	70	35.0	<0.001
rerniission	Moderate depression	2	2.0	16	8.0	
	Severe depression	6	6.0	1	0.5	
	No depression	60	60.0	139	69.5	
Da -4 Ea 11	Mild depression	28	28.0	36	18.0	0.198
rast ranure	Moderate depression	10	10.0	23	11.5	
	Severe depression	2	2.0	2	1.0	
Loss of Pleasure	No depression	39	39.0	111	55.5	
	Mild depression	41	41.0	59	29.5	0.002
	Moderate depression	14	14.0	29	14.5	
	Severe depression	6	6.0	1	.5	
	No depression	42	42.0	90	45.0	
Cuilty feeling	Mild depression	38	38.0	94	47.0	0.025
Gunty reening	Moderate depression	13	13.0	10	5.0	
	Severe depression	7	7.0	6	3.0	

	Groups			D		059/ C I for	
Overall Depression Score	Case		Control		r. voluo	OR	9570 C. 1 101
	No.	%	No.	%	value		U N
Mild or no depression	62	62.0	158	79.0	R		
Moderate/ Severe depression	38	38.0	42	21.0	0.002	2.306	1.360-3.910

Table (3): Association between depression and obesity.

DISCUSSION

The current study found through the results in table ⁽¹⁾ of this study of the sample that there was no significant difference between cases and controls in terms of age, residence, education, economic status occupation, and (P. value>0.05). This result similar to study conducted in Finland 2017 that found no association between cases and controls in above terms ⁽¹⁵⁾. While exercise the current study results indicates a significant association between exercise and obesity (p < 0.001), this agreed with a study was conducted in Erbil, Iraq in 2019 that was found there is a significant difference between obesity and practice regular exercise (p < 0.001) ⁽¹⁶⁾. Furthermore, new research shows that practice moderate physical activities per day prevents the progress of obesity and fat mass without restricting calories (17)

This study finding also show a significant association between obesity and family history of obesity, this explained that those have family history of obesity more likely for developing obesity and this corresponds with study conducted in Germany that showed people with a family history of obesity have a high prevalence of severe obesity compared with those without a family history of obesity ⁽¹⁸⁾. The results of this study indicates that the indicators "Permission," " Loss of Pleasure," " Guilty feeling," " Punishment feeling," " Selfdislike," "Criterion-self," " Changes in sleeping pattern," " Change in appetite " and " Body image " show significant differences between cases and controls. These differences explained that the cases have high score of depression compared to the control subjects. While other indicators of depression have no significant association between cases and controls. Also, the results of current study found a significant association between depression and obesity. It indicates that moderate or severe depression increases the odds of being obese by more than twofold with an odds ratio of (2.306). This agreed with numerous studies have reported that obesity was linked with depression symptoms with an odds ratio (1.18 to 5.25), depending on the studies and evaluation ways ^(19 21). Another recent study conducted by Almarhoon in Saudi Arabia in 2021 that show a significant association between moderate or severe depression and obesity (22). In contrast, our results disagreed with a study conducted in Iran that reported no association between obesity and depression (12).

Increase of severity of depression has been shown to be associated with decreased physical activity and increased calorie intake, with a consequent increase in the risk of obesity ⁽²³⁾. Depression may be a strong predictor of obesity for a number of reasons. First, hypersomnia and hyperplasia are caused by depression ⁽²⁴⁾. which consequently increased energy consumption and decreased energy expenditure, respectively ⁽²⁵⁾. Secondly, people who are depressed tend to eat worse than healthy people, and this can lead to more calories being consumed ⁽²⁶⁾. Third, people with atypical major depressive disorder had more disability days and days with reduced activities, which may have made them use less



energy expenditure ⁽²⁷⁾. The raised levels of systemic inflammation and metabolic dysregulation observed in obese individuals are identified as the fourth factor contributing to the association between obesity and depression ⁽²⁸⁾.

CONCLUSIONS

The current study concluded that those who had moderate or severe depression symptoms were more likely for developing obesity than those who had a mild or no depression symptoms.

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