The relationship between obesity and depression in individuals aged 57-77: a cross sectional analysis of the 2015 Mitchelstown Cohort Rescreen

C. Ní Lonargáin, S. Millar, Z. Kabir

School of Public Health, University College of Cork, Cork, Ireland

Introduction

- Obesity and depression are significant global healthcare burdens.
- An excess of €8.2 billion a year is spent by the Irish economy on mental health issues. Ireland ranked joint third in total spending out of 36 countries included in a recent OECD report.[1]
- Obese and overweight populations are at a higher risk of chronic mental illness.
- It has been shown that depressed patients may have a statistically significant higher prevalence of obesity, due to a variety of lifestyle factors that are known to cause poor physical health. These may be the same lifestyle factors that contribute to obesity.
- Individuals with a severe mental illness, including major depressive disorder, have an excess mortality which translates to 13-30 year decreased life expectancy; approximately sixty percent of this excess mortality results from physical illness.[2]
- Likewise, the obese cohort have a decreased life expectancy and are at an increased risk of developing poor physical health.[2]
- Research studies performed worldwide have proven that obesity and severe mental illness have a clinically significant association with each other.

Aim

- To estimate the prevalence of obesity among depressed adults aged 57-77.
- To assess relationships between obesity and depression, and to determine demographic and lifestyle factors that affect this association.

Method

- A cross-sectional analysis took place of the Mitchelstown Cohort Rescreen (MCR) study of 2015, a random sample of 1,366 men and women aged 57–77 years recruited from primary care.
- The overall obesity prevalence among individuals with and without a depression diagnosis in the MCR data was compared.
- Obesity was defined using recommended Body Mass Index classification.
- The presence of depression was based on participants' self-reported diagnosis of depression, or a major depression diagnosis as validated by the Centre for Epidemiologic Studies Depression scale (CES-D).
- Logistic regression was used to determine relationships between obesity and depression, adjusting for demographic and lifestyle factors available to the study.
- Further sub-group analysis was undertaken on the MCR to examine the influence of certain sociodemographic and lifestyle factors on obesity prevalence amongst those with and without psychiatric disorders.

Results

Descriptive Characteristics

- 14.2% of participants had depression; 13.4% of males and 15.1% of females.
- 32.2% of participants were obese; 36.5% of males and 27.7% of females.
- Mean BMI measurements for males (29.4 ± 6.7) were significantly higher than for females (27.9 ± 4.9).
- Obese participants had a borderline significant association with being depressed compared to participants of a normal weight. BMI as a continuous variable was borderline significantly associated with depression.
- Male participants had a lower level of education, higher alcohol intake, poorer dietary quality, a higher prevalence of type 2 diabetes.
- Males had better sleep quality than female participants.
- Univariate analysis showed a strongly significant association between poor sleep quality and depression.

Table 1. Characteristics of the study population – full sample and according to gender

Variable	Full sample (n=1366)	Males (n=695)	Females (n=671)	P-value
Age (median, IQR)	65.0 (60.6–69.4)	64.8 (60.6–69.3)	65.2 (60.6–69.4)	.697
Education category:				.001
Secondary or higher (n, %)	946 (69.3)	467 (67.2)	479 (71.4)	
Other (n, %)	104 (7.6)	42 (6.0)	62 (9.2)	
Primary only (n, %)	316 (23.1)	186 (26.8)	130 (19.4)	
Current smoker (n, %)	120 (8.8)	64 (9.2)	56 (8.4)	.568
High alcohol intake (n, %)	99 (7.2)	90 (12.9)	9 (1.3)	<.001
Poor diet quality[1] (n, %)	580 (43.2)	360 (52.9)	220 (33.1)	<.001
Low level physical activity (n, %)	967 (70.9)	500 (72.2)	467 (69.7)	.320
Poor sleep quality (n, %)	161 (11.9)	68 (9.9)	93 (13.9)	.023
Type 2 diabetes (n, %)	141 (10.3)	95 (13.7)	46 (6.9)	<.001
BMI, kg/m^2 (mean ± 1 SD)	28.7 ± 5.9	29.4 ± 6.7	27.9 ± 4.9	<.001
BMI category:				<.001
Normal weight (n, %)	292 (21.4)	92 (13.2)	200 (29.8)	
Overweight (n, %)	634 (46.4)	349 (50.2)	285 (42.5)	
Obese (n, %)	440 (32.2)	254 (36.5)	186 (27.7)	
Depression (n, %)	194 (14.2)	93 (13.4)	101 (15.1)	.376

Number and % are shown for categorical variables. BMI continuous is shown as a mean (± one standard deviation).
Age is shown as a median and interquartile range.

Logistic Regression

- When all lifestyle factors identified in the study were adjusted for, there were two variables that had a significant relationship with depression:
  - Obesity (OR = 1.7, 95% CI: 1.06, 2.74)
  - Poor sleep quality (OR = 4.23, 95% CI: 2.89, 6.20)

Table 3. Multivariable analysis[1] of the relationship between obesity and clinical depression.

	Model 1		Model 2		Model 3		Model 4	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
BMI category:								
Normal weight	1.00 (ref.)		1.00 (ref.)		1.00 (ref.)		1.00 (ref.)	
Overweight	1.21 (0.78–1.87)	.401	1.24 (0.80–1.93)	.335	1.24 (0.80–1.92)	.343	1.24 (0.80–1.92)	.346
Obese	1.62 (1.04–2.54)	.035	1.67 (1.06–2.62)	.026	1.61 (1.02–2.54)	.042	1.58 (1.00–2.50)	.051
Poor sleep quality	4.54 (3.13–6.57)	<.001	4.50 (3.10–6.53)	<.001	4.44 (3.06–6.45)	<.001	4.43 (3.05–6.43)	<.001

	Model 1		Model 2		Model 3		Model 4	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
BMI category:								
Normal weight	1.00 (ref.)		1.00 (ref.)		1.00 (ref.)		1.00 (ref.)	
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Discussion

Depression and Obesity

- Obese participants had 70% increased odds of having depression when compared to participants of a normal weight.
- An increase in weight can exacerbate depression, particularly through social means such as prejudice, discrimination and self- and societal-stigma.[3]
- High BMI often negatively affects self-esteem, self-image and body satisfaction, all of which are known risk factors for depression.
- Chronic pain that is directly caused by obesity, such as joint pain, back pain and fibromyalgia, is also known to result in depressive symptoms.
- Decreased motivation often leads to decreased physical activity, poor nutritional intake and increased intake of high-fat convenience foods. Comfort eating to overcome psychological strain results in a rising BMI.
- Some pharmacological treatments to treat depression are also known to have weight gain as a potential side effect, for example SSRIs, which are incidentally the first line treatment for the disorder.[3]

Depression and Sleep Quality

- Participants with poor sleep quality were four times as likely to have depression compared to participants with good quality sleep.
- These findings are consistent with previous research.
- Obstructive sleep apnea (OSA) is one potential cause for these findings.
- Depression coexists in 20% of OSA cases, and conversely, up to 20% of depressed patients may suffer from OSA.[4]
- Obesity is also a cause of OSA.

Conclusion

- In a relatively homogenous population of middle- to older-aged men and women, significant relationships exist between obesity and depression, and poor sleep quality and depression.
- The causal relationships between these factors are intricate and unclear and a greater understanding of the mechanisms involved is needed.
- The fact that one in seven clinically depressed people are obese, has serious economic and public health consequences.
- Targeted interventions for reducing depression should include better sleep quality and weight management measures.

References

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