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What is the association between obesity and the risk of suicide attempts and injuries in the Canadian and American female population?

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Abstract

Background: Obesity is a significant problem for many developed and developing countries. Estimates indicate that 15% of the Canadian population and 30% of the United States population are obese. Previous studies have shown Body Mass Index (BMI) may be associated with either an increased or decreased risk of suicide attempts and injuries.

Objective: We performed a structured literature review examining the association between obesity and the risk of suicide attempts and injuries in the Canadian and American female population.

Methods: The following search "(suicid*) AND ((BMI) OR (obesity) OR (body mass) OR (overweight))", was made in PubMed providing 689 results. After applying limitations, inclusion and exclusion criteria, 8 relevant studies were identified and analysed.

Results: Four articles suggested no association between obesity and suicide attempts. Two articles suggest there may be a positive association between obesity and mental disorders that leads to the risk of suicide. The two remaining articles suggest that the risk of death from suicide is inversely related to BMI.

Conclusion: Although some findings conclude a positive association between obesity and the risk of suicide, there are few studies examining this relationship within the female population and contradictory conclusions of an inverse relationship are present in some of these studies. It is suggested that further research should be done.

Introduction

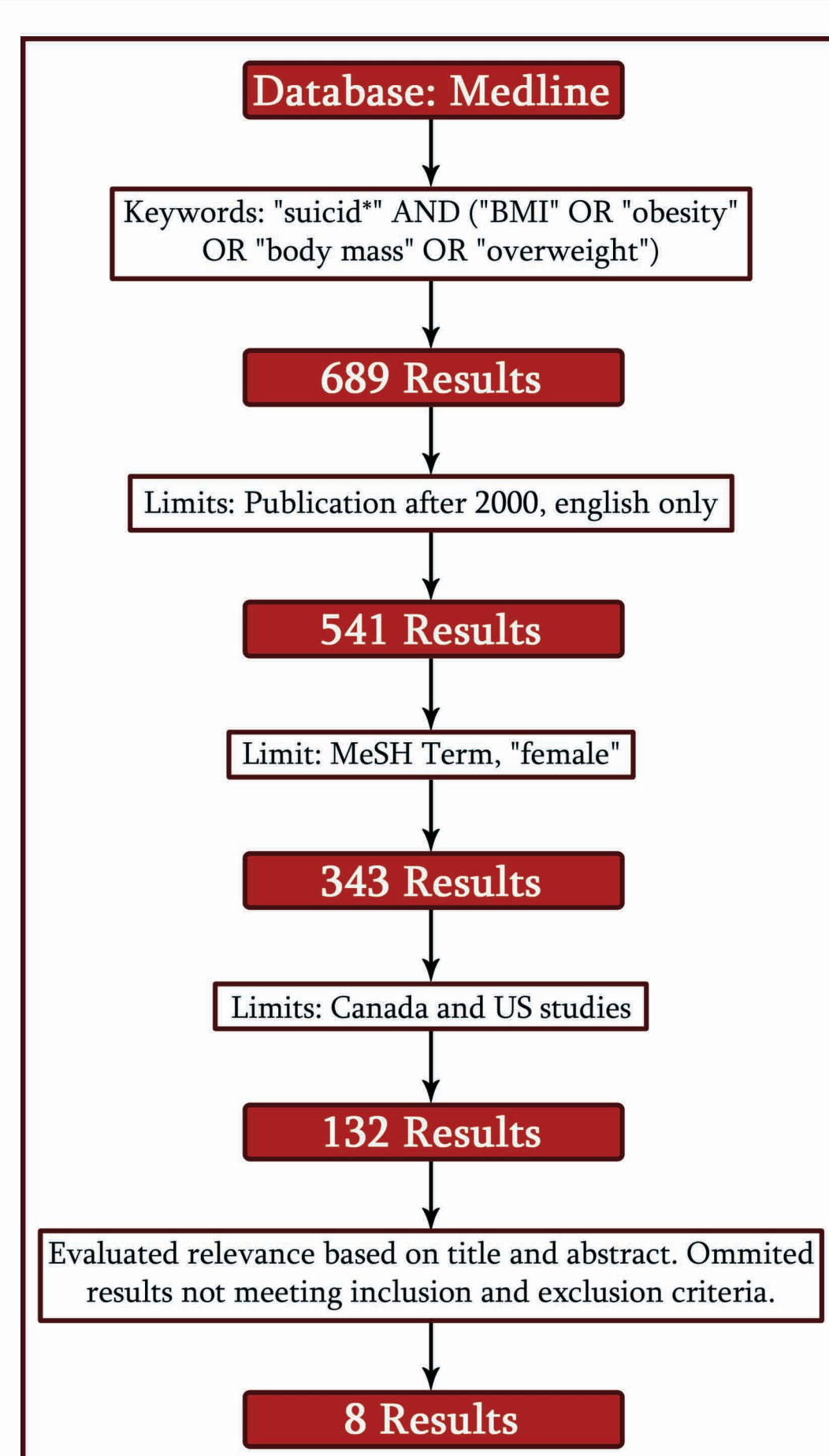
Obesity is a significant problem for many countries in the world^[1]. The number of people who are overweight or obese has been increasing since the 1980s, which has led to the emergence of a public health problem of epidemic proportion especially in the developed countries^[2]. Estimates indicate that at least 15% of the Canadian population and 30% of the United States population are obese^[1]. Similarly, 15% of European adults are obese and the number of obese individuals is over 250 million people worldwide^[1].

There is emerging evidence that there is a positive link between obesity and increased suicidal ideation and suicidal attempts^[3]. Previous studies have shown Body Mass Index (BMI) may be associated with both an increased or decreased risk of suicide attempts and injuries^[3].

Research Question

What is the association between obesity and the risk of suicide attempts and injuries in the Canadian and American female population?

Methods



A structured literature review identifying studies examining the association between obesity and suicide risk within the female population was conducted. The following search query, "(suicid*) AND ((BMI) OR (obesity) OR (body mass) OR (overweight))", was used to search the online database Medline through PubMed providing 689 results. The search was then limited to english articles published after 2000, containing the MeSH term "female", and studies examining populations in Canada or the United States reducing the search to 132 results. The titles and abstracts were then examined to determine the relevancy of the article for our review. Articles that were deemed relevant were checked to see if they met the inclusion and exclusion criteria shown in Table 1. Studies were selected using a 4-rater system, there was perfect agreement between raters (k=1.00). As a result, 8 studies were identified and the following data were extracted for the purposes of this review:

- Author's last name
- Definition of overweight or obesity status
- Study design
- Sample size
- Statistical analysis results (including confidence intervals if available)
- Possible confounders

Figure 1. Flowchart Illustrating Literature Selection Process

Methods (cont.)

Inclusion Criteria	Exclusion Criteria
- Canadian/American populations - Outcome of suicide attempt/injury - Suicide attempt/injury analysis was stratified according to BMI/overweight status - Quantitative studies - Examines a female population	- Male/Female data analysis is not separate - Focus population not representative of general population (veterans, inmates, etc.)

Table 1. Inclusion and Exclusion Criteria

Results

Authors	Study design & Sample size	Association value (%CI)	Conclusion	Comments
Mather et al. ^[1]	Cross-sectional (N= 19526)	Life time: AOR = 1.56 (95%, 1.19-2.04) Past year: AOR = 1.88(95%, 1.01-3.49)	Positive association	Adjusted for age, education, other psychiatric disorders, and Charlson comorbidity Index (includes sociodemographic and measure of physical illness burden)
Kaplan et al. ^[4]	Cross-sectional (N=261)	Adjusted Hazard ratio= 0.46 (95%, 0.26-0.81)	Inverse association	Adjusted for age, marital status, living arrangement, race/ethnicity, education, employment status, place of residence, region of residence, number of chronic conditions, number of psychiatric conditions, activity limitation, and self-rated health.
Dave & Rashad ^[5]	Cross-sectional (N=14180 to 15532)	Probit Regression - Attempt 0.0182 (95%), Injury - 0.0032	Positive association	Regression involving - drinking & driving, carrying weapons, fighting, smoking, substance abuse, sexual activity, team sports, school safety, and depression.
Mukamal et al. ^[3]	Longitudinal (N=74855)	BMI (30.0-34.9): HR = 0.73(95%, 0.50-1.07) BMI (≥35.0): HR = 0.62 (95%, 0.32-1.21)	Inverse association	
Eaton et al. ^[6]	Cross-sectional (N=6322)	Adjusted HR = 1.49 (95%, 1.00-2.23)	No association	- Race is a co-founder - Adjusted for Race/ethnicity
Lenhart et al. ^[7]	Cross-sectional (N=3,075)	OR = 0.467 (95%, 0.718-1.505)	No association	
Ratcliff et al. ^[8]	Cross-sectional (N=18)	OR = 1.55 (95%, 0.55-4.35)	No association	
Crow et al. ^[9]	Cross-sectional (N=2357)	AOR = 0.88(95%, 0.76-1.02)	No association	Adjusted for race, SES, and depression

Table 2. Summary of Results of Selected Articles

Many of the studies identified the following factors as confounders:

- Depression
- Risky behaviours (drinking, drugs, unprotected sex, etc.)
- Race/ethnicity
- Socio-economic status

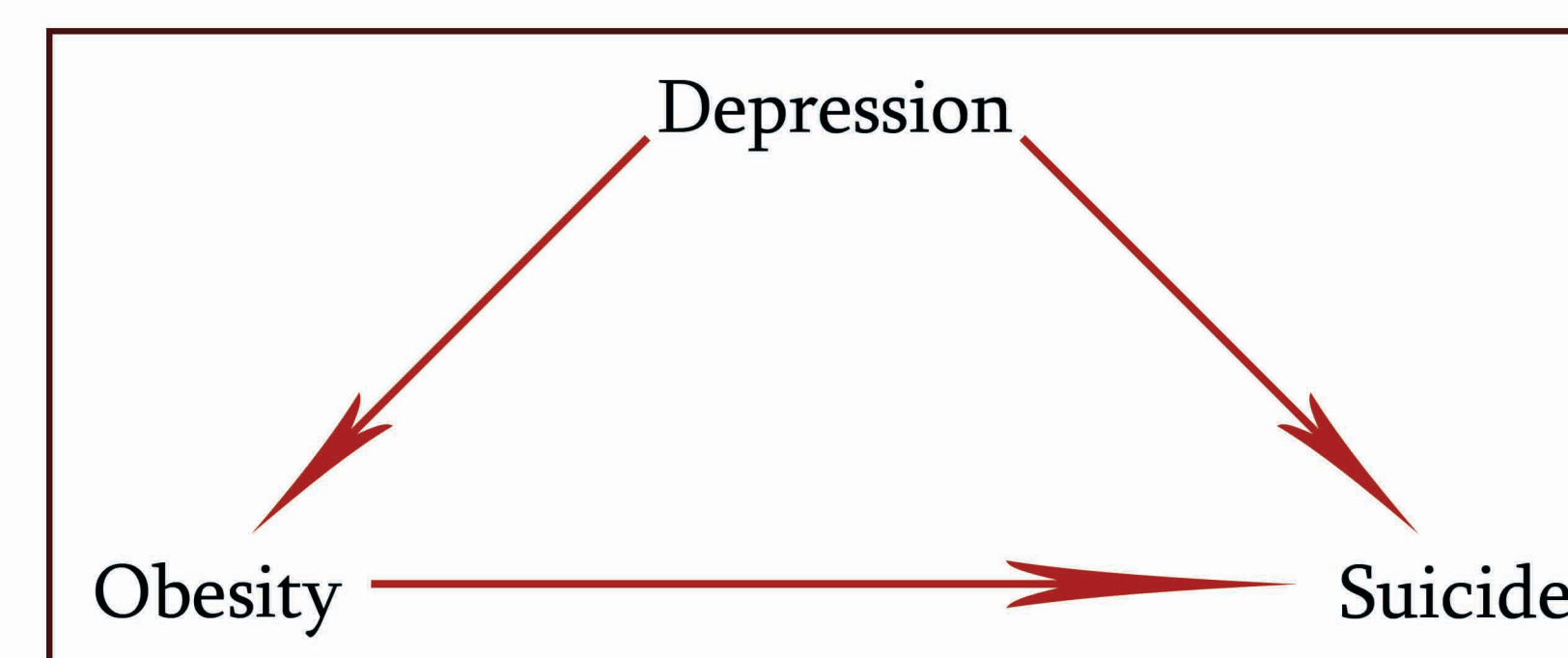


Figure 2. Depression as a Major Confounding Variable

Results (cont.)

Authors	Definition of obesity/BMI intervals
Mather et al.	Obesity = BMI ≥ 30
Kaplan et al.	Obesity = BMI ≥ 30; Respondents were classified into 4 weight categories: underweight, normal weight, overweight, and obese.
Dave & Rashad	At or above the 95th percentile are classified as being overweight according to the CDC growth charts.
Mukamal et al.	Categorized BMI (the weight in kilograms divided by the square of the height in meters) as underweight (<18.5), normal weight (18.5-22.9 and 23.0-24.9), grade 1 overweight (25.0-29.9), grade 2 overweight (30.0-39.9), and grade 3 overweight (40.0 or higher).
Eaton et al.	Obesity was defined as ≥ 95 percentile for BMI (calculated from self-reported height and weight).
Lenhart et al.	Adolescents with BMI values that corresponded to an adult BMI of 30.0 kg/m2 were classified as Obese.
Ratcliff et al.	Classified extreme obesity as BMI ≥ 99th percentile.
Crow et al.	Respondents were classified as underweight (BMI < 15th percentile), average weight (BMI 15th to <85th percentile), moderately overweight (BMI 85th to <95th percentile), or very over-weight (BMI ≥ 95th percentile).

Table 3. Obesity Definitions of Selected Articles

Discussion

Findings

- There is great heterogeneity in the conclusions of the studies.
- The association between obesity and suicide is unclear.

Limitations of the Study

- Only English studies were assessed
- Only studies that were accessible through the uOttawa library's subscription were used
- Time was a limiting factor as we were not able to use services such as interlibrary loan.
- The use of BMI across the studies was inconsistent.
- Results from cross-sectional data is not effective in determining cause-and-effect relationships

Contextualizing the Findings of the Literature

- It is very surprising there was contradictions with the data. We expected a positive association between obesity and suicide ideations/attempts due to our literature review.
- Research conducted outside of North America have similar conclusions that support the findings of our research.

Future Considerations

- More research is needed looking at potential confounders such as marital status, and socio-economic status.
- Standardizing the definition of obesity

Conclusion

The research findings were inconsistent and provided conflicting results. Future studies should consider confounding variables such as body image and beauty standards in females portrayed by the media and society. Further research should be done to better understand this relationship, and its impacts on our society.

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References available on a separate handout.