

Abstract

Background: Both obesity and depression are prominent in adolescence, however the relationship between them remains unclear.

Purpose/objectives: To examine the literature surrounding the relationship between obesity and depression in adolescence with the hope of understanding how the risk of developing one condition changes when an adolescent possesses the other.

Methods: The databases MEDLINE, PsycARTICLES, and Scholars Portal were used to identify epidemiological literature using the keywords *adolescence*, *depression*, and *obesity*. Inclusion criteria stated that data must have been collected in Canada or the United States and be published in the English language. An additional requirement was that studies involved greater than 100 participants in the adolescence age group as defined by the World Health Organization (10-19 years of age).

Results: Thirteen articles were included because they satisfied all inclusion criteria. The literature discussing the risk of developing obesity or depression given the presence of the other is inconclusive. The relationship is complex and may involve other factors such as body image.

Conclusion: More research is required to determine if risk of obesity or depression in adolescence is increased when the individual possesses the other. Further research should continue to consider the role of other covariates, such as body image, and their influence on adolescent depression and obesity. This research could have important implications for public health programming concerning mental health, nutrition, and physical activity.

Introduction

Obesity and depression are both prevalent and serious health concerns in adolescence. In the United States, the prevalence of obesity (BMI \geq 95th percentile for age and sex) between the ages of 12-17 was 17.8% in 2005-2006 (1). Additionally, the prevalence of major depressive disorder and dysthymia together in 13-18 year-olds is 11.2% (2). These conditions put adolescents at risk of further illness and disability (3,4). For future public health planning, it is important to understand the relationship between these two impairments.

Research Question

Does the risk of developing either depression or obesity in adolescence increase if the individual is obese or depressed?

Methods

The keywords *obesity*, *depression*, and *adolescence* were used to search for epidemiological literature in Scholars Portal, PsycARTICLES, and MEDLINE databases through the University of Ottawa Library. Inclusion criteria specified that articles must be published in the English language and must examine both obesity and depression in the timeframe of adolescence as defined by the World Health Organization (10-19 years of age) (5). Additionally, the studies must have taken place in Canada or the United States, and had greater than 100 participants. Two raters applied the inclusion criteria and would consult a third party (Dr. Deonandan) in the event of a discrepancy.

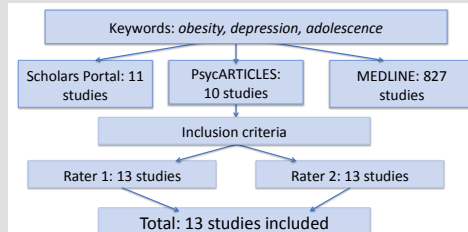


Figure 1. Results obtained from a systematic search of the literature.

Results

Table 1. Results obtained from the literature.

(Authors) Year	Sample	Methods/Design	Results
(6) 2011	918 adolescent girls (ages 11-14)	•Longitudinal •BMI (\geq 95 th percentile) •CESD Scale	•Among white girls, obesity in grade 6 was associated with greater likelihood of depressed mood in grade 8 (OR=2.47, 95% CI=1.85-3.3) •Among white girls, depressed mood in grade 6 was associated with greater likelihood of obesity in grade 8 (OR=4.47, 95% CI=1.96-10.24)
(7) 2010	496 adolescent girls (ages 11-15)	•Longitudinal •BMI (\geq 95 th percentile) •Modified version of K-SADS	•Obese status was associated with future depressive symptoms, but not major depression (p<0.01)
(8) 2005	9795 adolescents (1999) 8190 adolescents (2001) (ages 16-18)	•Cross-sectional •Self-reported BMI (\geq 95 th percentile) •Depressive symptoms self-reported	•No relationship between self-reported depressive symptoms and BMI
(9) 2002	9374 adolescents (ages 12-18)	•Longitudinal •Self-reported BMI (\geq 95 th percentile) •CESD scale	•After controlling for covariates, depressed mood at baseline predicted obesity at follow-up among those not obese at baseline (OR=2.05, 95% CI=1.18-3.56)
(10) 2012	43,297 adolescents (ages 10-17)	•Cross-sectional •BMI (\geq 95 th percentile) •National US Survey of Children's Health and telephone survey with parent	•Obese children were nearly 2 times more likely to have multiple comorbidity (including depression)
(11) 2012	1528 adolescents (ages 10-18)	•Longitudinal •BMI (split into 5 classes) •CESD scale	•Psychological distress was associated with higher BMI
(12) 2012	4150 adolescents (ages 12-19)	•Cross-sectional •BMI (\geq 95 th percentile) •NIMH Computerized Diagnostic Interview Schedule for Children	•Non-significant increase in the odds of obesity in those with MDD •Odds of obesity increased for males with MDD (adjOR=2.7, 95% CI=1.1-8.3) and all non-Hispanic blacks with MDD (adjOR=3.1, 95% CI=1.1-8.3)
(13) 2011	806 adolescents (ages 12-18)	•Longitudinal •Self-reported BMI (\geq 95 th percentile) •Depressive Mood Scale	•Significant association between obesity and depressed mood in males at T1 (p<0.05) and T2 (p<0.01) •Not associated when body dissatisfaction was controlled for
(14) 2006	3101 adolescents (ages 11-17)	•Cross-sectional •Self-reported BMI (\geq 95 th percentile) •Brief SCL-90 Depressive Symptom Scale	•Youth above the 90th percentile in the depressive symptom score had 2 times the odds of being obese (males OR=1.95, 95% CI=1.19-3.18, females OR=2.17, 95% CI=1.25-3.77) •Similar for all levels (except males in late puberty)
(15) 2013	986 adolescents (ages 11-15)	•Cross-sectional •BMI (low risk/high risk) •CES-DC scale	•No significant relationship between BMI and depression
(16) 2013	4,175 adolescent (ages 11-17)	•Cross-sectional •BMI (\geq 95 th percentile) •Diagnostic Interview Schedule for Children, V4	•Overweight or obese increased risk of major depression (OR=2.51, 95% CI=1.47-4.29) •In multivariate analysis weight was not associated with major depression
(17) 2005	496 adolescent girls (ages 11-15)	•Longitudinal •BMI (\geq 95 th percentile) •Adapted version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children	•Depressive symptoms at T1 predicted obesity onset in the univariate model (OR=4.62, 95% CI=1.67-12.74, p=0.004) but not in the multivariate model
(18) 2005	4743 adolescents (ages 11-18)	•Cross-sectional •BMI (\geq 95 th percentile) •CESD	•Obesity was only associated with depression in the age 12-14 adolescents (OR=2.83, 95% CI= 1.19-7.76)

Discussion

The literature surrounding the association between adolescent obesity and depression is conflicting. While univariate analyses often indicated an increase in risk of depression or obesity, controlling for covariates often rendered this association insignificant.

Important Findings and Implications

- Some evidence of increased risk for obesity or depression
- This association appears to exist in males and females, yet many studies analyze only female adolescents
- More longitudinal research involving both sexes is needed

Alternate Explanations for the Association

- Covariates
 - Body satisfaction, body image, perceived weight, and weight control behaviours
 - Physical fitness and physical activity levels
 - Race
- Gene x environment interaction

Limitations

- Using BMI as a measure of obesity can be problematic. BMI is an accurate measure for a large population, but can vary for individuals
- Measuring obesity and depression
 - Many studies used the CDC BMI cut-off for obesity (\geq 95th percentile), others used the WHO BMI cut-off (\geq 97th percentile)
 - Varying scales were used to measure depression
 - Bias in self-report measures of BMI (19) and depression (16)
 - Excluded literature (adulthood, additional databases)
- Cross-sectional data
 - Many studies on this topic use cross-sectional data from large databases, thus cause-effect inferences cannot be made

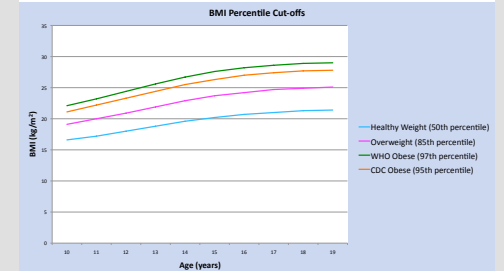


Figure 2. BMI percentile cut-offs for various weight categories of girls ages 10-19 according to the WHO and the CDC (20).

Conclusion

In conclusion, more primary research is required to understand if risk of developing depression or obesity increases when an adolescent possesses the other. Research findings are inconsistent and demonstrate conflicting results. Future studies should continue to consider other covariates, such as the role of body image, and their association with depression and obesity. This research could be significant in public health planning relating to mental health, nutrition, and physical activity.

References

Please ask presenter for printed reference list.