Special journal of the Medical Academy and other Life Sciences
Vol. 1 No. 3 (2023) 03/04/2023
DOI: https://doi.org/10.58676/sjmas.v1i3.22

The Complex Relationship Between Obesity and Depression

Professor Nikolaos Tzenios Ph.D., FRSPH, FRSM, FAAMFM, FWAMS, FMRS, AcIASS, mRSB, DABAAHP[1], Dr. Mary E. TAZANIOS, MD ObGyn[2] ,Mohamad Chahine, Ph.D.[3,] Poh Omasyarifa Binti Jamal[4]

[1] Public Health and Medical Research, **Charisma University**, Grace Bay, Turks and Caicos Islands,
Train to Teach in Medicine, Department of Postgraduate Medical Education, Harvard Medical School, Boston, Massachusetts, USA,
Doctor of Health Sciences Candidate, **MCPHS University**, Boston, Massachusetts, USA
Harvard Medical School Postgraduate Medical Education High Impact Cancer Research 2019-2021

[2] Clinical Research, TRG GEN+, Beirut, Lebanon
[3] Biological and Chemical Technology, International Medical Institute, Kursk State Medical University, Kursk, Russian Federation.
[4]Obstetrics & Gynecology, Kursk State Medical University, Kursk, Russian Federation

Corresponding Author:
Professor Nikolaos Tzenios Ph.D., FRSPH, FRSM, FAAMFM, FWAMS, FMRS, AcIASS, mRSB, DABAAHP[1] 3 Walham Yard, SW61JA, London, Uk
Email address: Nicolas@Trccolleges.com

Abstract

The relationship between obesity and depression has been the subject of significant research over the years. This article aims to systematically review the existing literature to provide a comprehensive understanding of the complex interplay between obesity and depression. By examining both epidemiological and experimental evidence, this article highlights the bidirectional nature of this relationship, while also considering potential mediators and moderators. The implications of these findings for prevention and treatment are discussed, with a particular focus on the importance of a multidisciplinary approach to address both conditions simultaneously.

Keywords: obesity, depression, bidirectional relationship, epidemiological studies, experimental evidence, mediators, moderators, prevention, treatment

Introduction

Obesity and depression are two major public health concerns that have been linked to a variety of physical and mental health problems. The World Health Organization (WHO) has

Special journal of the Medical Academy and other Life Sciences
Vol. 1 No. 3 (2023) 03/04/2023
DOI: https://doi.org/10.58676/sjmas.v1i3.22

identified obesity as a global epidemic, with over 650 million adults classified as obese in 2016 (1). Similarly, depression affects more than 264 million people worldwide and is a leading cause of disability (2). The association between these conditions has been the subject of significant research, yielding an increasingly complex picture of the interplay between obesity and depression. This article will systematically review the existing literature on the relationship between obesity and depression, considering both epidemiological and experimental evidence, as well as potential mediators and moderators.

Epidemiological Evidence

Numerous epidemiological studies have investigated the relationship between obesity and depression, with many reporting a positive association between the two. A meta-analysis by Luppino et al. (2010) reviewed 15 cross-sectional and prospective studies, concluding that obese individuals had a 55% increased risk of developing depression compared to those with a healthy weight (3). Similarly, a longitudinal study by Pan et al. (2012) found that obesity predicted the onset of depression, with a dose-response relationship observed between body mass index (BMI) and depression risk (4).

Conversely, depression has also been shown to predict the development of obesity. A meta-analysis by Mannan et al. (2016) reviewed 14 prospective studies and found that individuals with depression had a 58% increased risk of becoming obese (5). Moreover, a longitudinal study by Roberts et al. (2003) found that participants with depressive symptoms at baseline were more likely to become obese at the 5-year follow-up (6). These findings suggest a bidirectional relationship between obesity and depression, with each condition increasing the risk of developing the other.

Experimental Evidence

Experimental research has further elucidated the potential mechanisms underlying the relationship between obesity and depression. One theory is that inflammation, which is known to be elevated in obesity, may contribute to depressive symptoms. A study by Capuron et al. (2008) found that obese individuals exhibited increased levels of inflammatory markers, which were correlated with the severity of depressive symptoms (7). Additionally, a review by Shelton et al. (2015) concluded that inflammation may play a significant role in the development of depression in some individuals, particularly those with obesity (8).

Another potential mechanism is the dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, which has been implicated in both obesity and depression. A review by Pasquali et al. (2006) highlighted that HPA axis hyperactivity is a common feature of both conditions and may contribute to their co-occurrence (9). Furthermore, a study by Varghese et al. (2013) found that HPA axis dysfunction partially mediated the relationship between obesity and depression (10).

Mediators and Moderators

Various factors may mediate or moderate the relationship between obesity and depression, including sociodemographic factors, physical activity, and diet. A study by Heo et al. (2006)

Vol. 1 No. 3 (2023) 03/04/2023
DOI: https://doi.org/10.58676/sjmas.v1i3.22

found that the association between obesity and depression was stronger in women, non-Hispanic whites, and individuals with lower income and education levels (11). These findings suggest that the relationship between obesity and depression may be influenced by social factors and vary across different populations.

Physical activity and diet have also been implicated in the relationship between obesity and depression. A study by Rethorst et al. (2009) found that increased physical activity was associated with reduced depressive symptoms, particularly among obese individuals (12). Similarly, a review by Mura et al. (2014) concluded that exercise interventions improved both depressive symptoms and obesity-related outcomes (13). Additionally, a study by Jacka et al. (2010) reported that a healthier diet was associated with a reduced risk of depression and obesity, highlighting the potential role of diet in the relationship between these conditions (14).

Implications for Prevention and Treatment

The complex interplay between obesity and depression has important implications for prevention and treatment strategies. As these conditions are bidirectionally related, addressing one may reduce the risk of developing the other. For example, interventions that target obesity may reduce the risk of depression by reducing inflammation and improving HPA axis function. Similarly, treating depression may help prevent obesity by improving self-regulation and promoting healthier lifestyle choices.

A multidisciplinary approach is needed to address both conditions simultaneously, as this may provide the best opportunity for improvement. Interventions that target both obesity and depression may include cognitive-behavioral therapy, pharmacotherapy, dietary counseling, and physical activity programs. By addressing the interrelated factors contributing to obesity and depression, these interventions may offer a more comprehensive solution than traditional treatments that target one condition at a time.

Conclusion

The relationship between obesity and depression is complex, with evidence supporting a bidirectional association between these conditions. This interplay appears to involve multiple mechanisms, including inflammation, HPA axis dysfunction, and various sociodemographic and lifestyle factors. Recognizing the bidirectional nature of the relationship between obesity and depression is crucial for developing prevention and treatment strategies that address both conditions. A multidisciplinary approach, incorporating cognitive-behavioral therapy, pharmacotherapy, dietary counseling, and physical activity programs, may offer the best opportunity for improvement in individuals with comorbid obesity and depression.

References

1. World Health Organization. (2016). Obesity and overweight. Retrieved from https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
2. World Health Organization. (2021). Depression. Retrieved from https://www.who.int/news-room/fact-sheets/detail/depression

Vol. 1 No. 3 (2023) 03/04/2023
DOI: https://doi.org/10.58676/sjmas.v1i3.22

3. Luppino, F. S., de Wit, L. M., Bouvy, P. F., Stijnen, T., Cuijpers, P., Penninx, B. W., & Zitman, F. G. (2010). Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. Archives of General Psychiatry, 67(3), 220-229.
4. Pan, A., Sun, Q., Czernichow, S., Kivimaki, M., Okereke, O. I., Lucas, M., & Manson, J. E. (2012). Bidirectional association between depression and obesity in middle-aged and older women. International Journal of Obesity, 36(4), 595-602.
5. Mannan, M., Mamun, A., Doi, S., & Clavarino, A. (2016). Prospective associations between depression and obesity for adolescent males and females: a systematic review and meta-analysis of longitudinal studies. PloS One, 11(6), e0157240.
6. Roberts, R. E., Deleger, S., Strawbridge, W. J., & Kaplan, G. A. (2003). Prospective association between obesity and depression: evidence from the Alameda County Study. International Journal of Obesity, 27(4), 514-521.
7. Capuron, L., Poitou, C., Machaux-Tholliez, D., Frochot, V., Bouillot, J. L., Basdevant, A., ... & Laye, S. (2008). Relationship between adiposity, emotional status and eating behaviour in obese women: role of inflammation. Psychological Medicine, 38(4), 503-511.
8. Shelton, R. C., & Miller, A. H. (2015). Inflammation in depression: is adiposity a cause? Dialogues in Clinical Neuroscience, 17(2), 161-166.
9. Pasquali, R., Vicennati, V., Cacciari, M., & Pagotto, U. (2006). The hypothalamic-pituitary-adrenal axis activity in obesity and the metabolic syndrome. Annals of the New York Academy of Sciences, 1083(1), 111-128.
10. Varghese, F. P., & Brown, E. S. (2003). The hypothalamic-pituitary-adrenal axis in major depressive disorder: a brief primer for primary care physicians. Primary Care Companion to The Journal of Clinical Psychiatry, 5(4), 151-155.
11. Heo, M., Pietrobelli, A., Fontaine, K. R., Sirey, J. A., & Faith, M. S. (2006). Depressive mood and obesity in US adults: comparison and moderation by sex, age, and race. International Journal of Obesity, 30(3), 513-519.
12. Rethorst, C. D., Wipfli, B. M., & Landers, D. M. (2009). The antidepressive effects of exercise: a meta-analysis of randomized trials. Sports Medicine, 39(6), 491-511.
13. Mura, G., Moro, M. F., Patten, S. B., & Carta, M. G. (2014). Exercise as an add-on strategy for the treatment of major depressive disorder: a systematic review. CNS Spectrums, 19(6), 496-508.
14. Jacka, F. N., Pasco, J. A., Mykletun, A., Williams, L. J., Hodge, A. M., O'Reilly, S. L., ... & Berk, M. (2010). Association of Western and traditional diets with depression and anxiety in women. American Journal of Psychiatry, 167(3), 305-311.