Depression and Quality of Life Outcomes of Adolescents Post Bariatric Surgery: A Systematic Review

Joyce K. Graves, PHD, RN
School of Nursing
California State University, Los Angeles, CA.

Kathryn A. Hillstrom, EdD, MPH, RD, CDE
Nutritional Science
California State University, Los Angeles, CA.

No conflict of interest to disclose.

Purpose of Study

- Assess reported changes in depression and quality of life (QOL) among adolescents post bariatric surgery
- Examine instrumentation utilized to assess depression and QOL
- Analyze average length of time for patient follow-up
- Summarize the age and gender trends for adolescents selecting bariatric surgery

Prevalence of Obesity

Obesity facts globally:

- Worldwide - the rate of obesity has nearly doubled since 1980 (Finucane, et al., 2011)
- The United States has the highest rates of overweight and obesity, with a third of the population obese (Wang, 2011)
- Obese adolescents quadrupled in the past 30 years (Ogden, 2014)
- Obese adolescents (12 – 19 years) increased from 5% - 21% in the past 30 years (National Center for Health Statistics, 2011)

Risk Factors for Obese Adolescents

1. In one study, 70% of obese youth ages 5 - 17 years had at least one risk factor for cardiovascular disease (Freedman, 2007)

2. Obese adolescents are more likely to be pre-diabetic (CDC, 2011)

3. Obese adolescents are prone to more psychosocial problems, such as stigmatization and poor self-esteem (Freedman, 2007)

4. Adolescents who are obese are more likely to be obese adults (Freedman, 2005)

Comorbidities in Obese Adolescents

- 1. Psychological impairment was found in 52% of obese adolescents presenting for surgery; one third had clinically significant rates of depression (Zeller, et al., 2006)

- 2. A landmark study by Schwimmer et al. (2003) found obese adolescents had a 5.5 times greater impairment in psychosocial health than others.

- The quality of life of obese adolescents was found to be similar to children diagnosed with cancer receiving chemotherapy (Schwimmer, et al., 2003).

Treatment Options for Obese Adolescents

- Treatment options remain limited to: 1) medications, 2)lifestyle change programs and 3) bariatric surgery (Austin, Smith & Ward, 2012)

1. Medications are limited and show minimal success in the treatment of adolescent obesity (Freemark, 2007)

2. Weight management programs are frequently prescribed but show modest weight loss (Kalarchian et al., 2009; O'Brien et al., 2010)

3. Bariatric surgery has moved from the novel to the accepted effective way to resolve multiple weight comorbidities (Wilcox & Brennan, 2004)

Historical Evolution of Bariatric Surgery

- Bariatric surgery for adolescents was first reported in 1970
- Initially, the Roux-n-Y (RYGB) was most frequently performed followed by laparoscopic gastric banding (LABG), which is reversible (Pfeil, 2011)
- Gastric banding rates have fallen because of complications and weight regain (Pallati, et al., 2012).

Historical Evolution continued . . .

- In 2009, insurance companies began covering vertical sleeve gastrectomies.

- In the first multi-center trial in the U.S the surgical techniques performed were as follows*:

  RYGB (66%)

  Vertical sleeve gastrectomies (28%)

  Adjustable gastric banding (6%)

* from the Teen Longitudinal Assessment of Bariatric Surgery known as Teen-Labs (Inge, et al., 2014)

Method

- This review examined the psychosocial status of adolescents after bariatric surgery in two domains, depression and quality of life, and assessed whether there currently exists enough data to recommend bariatric surgery as a means to decrease depression and improve the quality of life.

- Medline, Cochrane, CINAHL and Web of Science were searched until November 2014 using key words: adolescent obesity, depression, quality of life and bariatric surgery. Grey literature and dissertations were not included.

Results

- 10 studies were included
- 322 patients were included
- Number of patients per study ranged from 10 – 101 patients from Austria, Australia, Sweden and the United States
- 9 prospective studies, 1 randomized controlled study
- Follow-up time 3.6 months to 11.5 years

Gender and Ethnicity

- Gender data was available for 311 patients -

  214 (70% female) 97 (30% male)
- Only 5 studies (n=174) included racial/ethnic information:

  97 White - 54%

  26 Black – 15%

  40 Hispanic – 23%

  1 biracial - .006%

  10 “other” or not indicated - .06%

Instrumentation

- Measurement questionnaires – much variety in what was utilized:
- 4 quality of life (QOL)
- 2 QOL, weight related QOL and depression
- 2 QOL and depression
- 1 QOL and weight-related QOL
- 1 depression

Depression Questionnaires

- 3 Different Instruments used:

1. 4 - Beck Depression Inventory – BDI-II (one used a Swedish version)

2. 21 – Beck Depression Inventory – BDI (original)

3. 1 – Beck Swedish version of Beck Youth Inventory (BSI)

Quality of Life Questionnaires

- 6 different quality of life (QOL) questionnaires utilized:

1. 4 Pediatric Quality of Life (PedsQL)
2. 3 Moorehead-Ardelt Quality of Life (part of Bariatic Analysis and Reporting Outcomes (BAROS)
3. 2 Impact of Weight on Quality of Life (IWQOL- Kids)
4. 1 Impact of Weight on Quality of Life – Lite
5. 1 Medical Outcomes Short Form (SF-36)
6. 1 Child Health Questionnaire (CF-50)

(Two studies used two QOL questionnaires

Discussion

- Most articles in this review reported an overall and positive change in the quality of life.
- One study showed a resolution of clinical depression rates 9 months after surgery Holterman, 2007)
- Patients were removed from medication due to decreased depression rates post-surgery (Zeller, et. al., 2009)
- After one year, patients reported a QOL and depressive symptoms similar to normal weight or nonclinical adolescents (Zeller, et al., 2011)

Discussion continued . . .

- Significant improvements in physical health, self-esteem and social interactions were found in two studies (Collins et al., 2007 & O'Brian, 2010)
- However, another study indicated that four patients needed a psychiatric appointment at their first post-op visit and six showed declines in psychosocial functioning at four months (Jarvholm et al, 2012)

Discussion continued . . .

- The short length of follow-up in five studies was less than a year so the subset of population unsuccessful is neglected
- Patients as young as 9 years and as old as 20 years were labeled adolescents.
- Questionnaires for adults were used for adolescents.
- American academy of Pediatric set eligibility age for bariatric surgery when adolescents reach skeletal maturity, which is 13 years for girls and 15 years for boys.

Conclusions

- Standardization of age parameters or adolescent measurement tools is necessary for accurate comparisons
- Questionnaires used should be age specific
- Larger, longer, multicenter follow-up studies are necessary to help predict success with bariatric surgery.
- Mixed method studies utilizing quantifiable instruments specific for adolescents are optimal to measure psychosocial health before and after bariatric surgery for in-depth data to alert health personnel of potential problems

References

- Austin, H., Smith, K. C., & Ward, W. L. (2012). Bariatric surgery in adolescents: what's the rationale? What's rational? *Int Rev Psychiatry, 24*(3), 254-261. doi: 10.3109/09540261.2012.678815

- CDC. National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011 [pdf 2.7M]. Atlanta, GA: U.S. Department of Health and Human Services.

- Collins, J., Mattar, S., Qureshi, F., Warman, J., Ramanathan, R., Schauer, P., & Eid, G. (2007). Initial outcomes of laparoscopic Roux-en-Y gastric bypass in morbidly obese adolescents. *Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery, 3*(2), 147-152.

- *de Onis M, Blossner M, Borghi E. Global prevalence and trends of overweight and obesity among preschool children. (2010) Am J Clin Nutr. 92:1257-64.*

- Finucane MM, Stevens GA, Cowan MJ, Danaei G, Lin JK, Paciorek CJ, Singh GM, Gutierrez HR, Lu Y, Bahalim AN, et al. (2011). National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9· 1 million participants. The Lancet. 2011;377:557–567

References continued

- Freedman DS, Kettel L, Serdula MK, Dietz WH, Srinivasan SR, Berenson GS. (2005) The relation of childhood BMI to adult adiposity: the Bogalusa Heart Study. *Pediatrics*; 115:22–27.

- Freedman DS, Zuguo M, Srinivasan SR, Berenson GS, Dietz WH. (2007). Cardiovascular risk factors and excess adiposity among overweight children and adolescents: the Bogalusa Heart Study. *Journal of Pediatrics* 150(1):12–17

.

- Inge, T. H., Zeller, M. H., Jenkins, T. M., Helmrath, M., Brandt, M. L., Michalsky, M. P., . . . Buncher, R. (2014). Perioperative outcomes of adolescents undergoing bariatric surgery: the outcomes of adolescents undergoing bariatric surgery: the Teen-Longitudinal Assessment of Bariatric Surgery (Teen-LABS) study. *JAMA Pediatr, 168*(1), 47-53. doi: 10.1001/jamapediatrics.2013.4296

- Jarvholm, K., Olbers, T., Marcus, C., Marild, S., Gronowitz, E., Friberg, P., . . . Flodmark, C. E. (2012). Short-term psychological outcomes in severely obese adolescents after bariatric surgery. *Obesity (Silver Spring), 20*(2), 318-323. doi: 10.1038/oby.2011.310

- Kalarchian, M. A., Levine, M. D., Arslanian, S. A., Ewing, L. J., Houck, P. R., Cheng, Y., . . . Marcus, M. D. (2009). Family-Based Treatment of Severe Pediatric Obesity: Randomized, Controlled Trial. *Pediatrics, 124*(4), 1060-1068. doi: 10.1542/peds.2008-3727

References continued . . .

- Kushi LH, Byers T, Doyle C, Bandera EV, McCullough M, Gansler T, et al. American Cancer Society guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA: (2012) A Cancer Journal for Clinicians* 2006;56:254–281.National Center for Health Statistics. Health, United States, 2011: With Special Features on Socioeconomic Status and Health. Hyattsville, MD; U.S. Department of Health and Human Services;

- O'Brien, P. E., Sawyer, S. M., Laurie, C., Brown, W. A., Skinner, S., Veit, F., . . . Dixon, J. B. (2010). Laparoscopic adjustable gastric banding in severely obese adolescents: a randomized trial. *JAMA, 303*(6), 519-526. doi: 10.1001/jama.2010.81

- Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. (2014) *Journal of the American Medical Association*;311(8 Pallati, P., Buettner, S., Simorov, A., Meyer, A., Shaligram, A., & Oleynikov, D. (2012). Trends in adolescent bariatric surgery evaluated by UHC database collection. *Surgical Endoscopy, 26*(11), 3077-3081. doi: 10.1007/s00464-012-2318-0

- Pfeil, M. (2011). Weight loss surgery for morbidly obese adolescents: a review. *J Child Health Care, 15*(4), 287-298. doi: 10.1177/1367493510397709

- Schwimmer, J. B., Burwinkle, T. M., & Varni, J. W. (2003). Health-related quality of life of severely obese children and adolescents. *JAMA, 289*(14), 1813-1819. doi: 10.1001/jama.289.14.1813

References continued . . .

- *Wang YC, McPherson K, Marsh T, Gortmaker SL, Brown M. (2011) Health and economic burden of the projected obesity trends in the USA and the UK. Lancet. 378:815-25*

- Willcox, K., & Brennan, L. (2014). Biopsychosocial outcomes of laparoscopic adjustable gastric banding in adolescents: a systematic review of the literature. *Obesity Surgery, 24*(9), 1510-1519. doi: 10.1007/s11695-014-1273-3

- Zeller, M. H., Modi, A. C., Noll, J. G., Long, J. D., & Inge, T. H. (2009). Psychosocial functioning improves following adolescent bariatric surgery. *Obesity (Silver Spring), 17*(5), 985-990. doi: 10.1038/oby.2008.644

- Zeller, M. H., Reiter-Purtill, J., Ratcliff, M. B., Inge, T. H., & Noll, J. G. (2011). Two-year trends in psychosocial functioning after adolescent Roux-en-Y gastric bypass. *Surg Obes Relat Dis, 7*(6), 727-732. doi: 10.1016/j.soard.2011.01.034

- Zeller, M. H., Roehrig, H. R., Modi, A. C., Daniels, S. R., & Inge, T. H. (2006). Health-related quality of life and depressive symptoms in adolescents with extreme obesity presenting for bariatric surgery. *Pediatrics, 117*(4), 1155-1161. doi: 10.1542/peds.2005-1141