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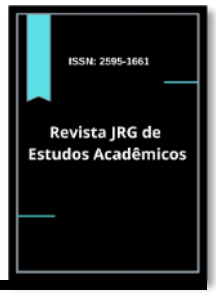

A influência da escolaridade e renda no perfil psicopatológico de pacientes pós-bariátricos

The influence of education and income on the psychopathological profile of post-bariatric patients

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Resumo

Introdução: A cirurgia bariátrica é uma intervenção eficaz no controle da obesidade grave, mas os fatores psicossociais, como escolaridade e renda, podem influenciar significativamente os resultados pós-operatórios, especialmente no que diz respeito à saúde mental. Objetivo: Analisar a influência da escolaridade e da renda no perfil psicopatológico de pacientes submetidos à cirurgia bariátrica. Métodos: Estudo transversal, com amostragem por conveniência, envolvendo 124 pacientes bariátricos acompanhados por equipe multiprofissional. Foram utilizados instrumentos validados para avaliação de sintomas de estresse, ansiedade, depressão, compulsão alimentar e traços de personalidade. A coleta foi realizada por questionário online e os dados analisados com testes estatísticos apropriados à natureza das variáveis, adotando-se nível de significância de 5%. Resultados: Verificou-se que pacientes com menor escolaridade e renda apresentaram escores significativamente mais altos em sintomas psicológicos e comportamentais disfuncionais. A presença de compulsão alimentar e traços de isolamento emocional foi mais prevalente entre indivíduos em situação de vulnerabilidade social. Conclusão: Os resultados apontam para a importância de considerar os determinantes sociais da saúde no acompanhamento de pacientes pós-bariátricos. Intervenções psicossociais devem ser incorporadas de forma sistemática, com atenção especial às desigualdades educacionais e econômicas, promovendo cuidado integral e equitativo.

Palavras-chave: Obesidade mórbida. Cirurgia bariátrica. Saúde mental. Transtornos alimentares. Fatores socioeconômicos. Educação. Renda. Psicopatologia.

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Abstract
Introduction: Bariatric surgery is an effective intervention for controlling severe obesity, but psychosocial factors such as education and income can significantly influence postoperative outcomes, especially with regard to mental health. Objective: To analyze the influence of education and income on the psychopathological profile of patients undergoing bariatric surgery. Methods: Cross-sectional study, with convenience sampling, involving 124 bariatric patients monitored by a multidisciplinary team. Validated instruments were used to assess symptoms of stress, anxiety, depression, binge eating, and personality traits. Data collection was performed using an online questionnaire and the data were analyzed with statistical tests appropriate to the nature of the variables, adopting a significance level of 5%. Results: It was found that patients with lower education and income had significantly higher scores on dysfunctional psychological and behavioral symptoms. The presence of binge eating and traits of emotional isolation was more prevalent among individuals in situations of social vulnerability. Conclusion: The results point to the importance of considering the social determinants of health in the monitoring of post-bariatric patients. Psychosocial interventions should be incorporated systematically, with special attention to educational and economic inequalities, promoting comprehensive and equitable care.

Keywords: *Morbid obesity. Bariatric surgery. Mental health. Eating disorders. Socioeconomic factors. Education. Income. Psychopathology.*

1. Introduction

Obesity is a chronic multifactorial condition that affects millions of people worldwide and represents one of the main public health challenges of the 21st century. Associated with a series of comorbidities, such as type 2 diabetes, arterial hypertension, dyslipidemia and sleep apnea, obesity significantly compromises the quality of life and reduces the life expectancy of the affected population. When conventional weight loss methods, such as diet, physical activity and medication use, are not effective, bariatric surgery becomes an important therapeutic alternative, providing significant results in terms of weight loss and control of comorbidities. However, the surgical process and the postoperative period involve a complex psychosocial and emotional adaptation that can trigger or intensify psychopathological symptoms (1) .

The monitoring of patients undergoing bariatric surgery must therefore go beyond clinical and nutritional dimensions, also considering psychological and psychiatric aspects. Mood disorders, such as depression and anxiety, changes in body image, binge eating and increased risk of suicide are problems that may emerge or worsen after the procedure (2) . Such issues indicate that obesity is not reduced to an isolated organic condition, but also involves psychological suffering and social determinants that directly influence the patient's trajectory before and after surgery. Therefore, understanding the psychopathological profile of these individuals is essential to ensure a more comprehensive and effective therapeutic approach (3) .

In this context, sociodemographic factors, such as education and income, play a crucial role in modulating the impacts of bariatric surgery on mental health. The level of education directly influences access to information, understanding of the surgical process, management of expectations and adherence to postoperative guidelines. Individuals with higher levels of education tend to have greater coping skills, better communication with the health team and a broader repertoire of adaptive strategies in the face of the changes imposed by the procedure. In contrast, lower levels of

education may be associated with cognitive difficulties, lower engagement in treatment and greater vulnerability to emotional disorders (4) .

Likewise, income significantly interferes with patients' living conditions and self-care opportunities. Financial stability allows access to healthier food, quality health services, medications, and ongoing psychological support. On the other hand, low-income patients face structural obstacles that compromise long-term therapeutic success, such as food insecurity, difficulty in getting to health services, work overload, and limitations in acquiring nutritional supplements. Such barriers not only impair the physical outcomes of surgery, but also accentuate feelings of frustration, anguish, and abandonment, increasing the risk of psychopathological worsening (5) .

Furthermore, the intersection between low education and limited income increases social exclusion and marginalization of patients, hindering their productive and social reintegration after weight loss. Bariatric surgery, although it represents a milestone in physical and functional transformation, does not guarantee, by itself, overcoming the stigmas associated with obesity, especially in contexts of social vulnerability. Dissatisfaction with aesthetic results, persistent self-destructive behaviors and emotional isolation often persist even after weight loss, indicating that physical changes are not enough to reverse psychological patterns that have been established throughout life (6) .

Studies have shown that improvements in clinical indices after surgery do not necessarily translate into psychological well-being (7) . In some situations, rapid weight loss and the demands of a new lifestyle can trigger identity crises, interpersonal conflicts, and behavioral relapses, such as a return to binge eating (8) . The lack of emotional and psychotherapeutic support worsens this scenario, making the assessment of the psychopathological profile an essential component for the early detection of signs of psychological distress. Such assessments, when combined with knowledge of sociodemographic factors, allow for the planning of more individualized interventions that are sensitive to the realities of each patient (9) .

Despite the growing scientific production on the effects of bariatric surgery, there are still few studies that explore the relationship between socioeconomic status and mental health in this context in an integrated manner. Approaches often prioritize clinical or nutritional outcomes, neglecting the complexity of the subjective dimensions involved in the process. In this sense, it is urgent to expand the scope of investigations, incorporating variables such as education and income in multivariate analyses that consider the patient as a whole. Understanding these interactions is essential to reduce inequalities in care and promote more equitable and effective monitoring (10) .

By recognizing that social determinants of health directly influence psychological distress, it is possible to advance public policies and clinical practices that consider comprehensive care. Health professionals need to be alert to signs of emotional distress and have strategies adapted to the particularities of patients in different socioeconomic contexts. Personalized psychological monitoring, strengthening support networks, and encouraging health education are measures that can minimize the negative impact of social inequality on surgical outcomes. To this end, it is essential to invest in studies that map these profiles and provide evidence for the development of fairer and more inclusive protocols.

Given this scenario, this study aims to analyze the influence of education and income on the psychopathological profile of patients undergoing bariatric surgery, in order to identify possible associations between socioeconomic factors and the psychological symptoms presented in the postoperative period.

2. Method

This study presents a quantitative and cross-sectional approach, using intentional convenience sampling, with data collection performed exclusively through an online questionnaire. The research followed the STROBE and CHERRIES guidelines, ensuring greater methodological rigor, clarity and transparency in the presentation of observational data and electronic collection procedures. These protocols aim to standardize the description of health research methods, especially with regard to conducting studies with virtual questionnaires.

Participants were 124 adult patients who underwent bariatric surgery (bypass or sleeve) between 18 and 144 months prior to collection, all followed by the same medical team in Juazeiro do Norte, Ceará. These individuals were invited to participate voluntarily through an individual online invitation. The sample was selected based on well-defined criteria, including minimum age of 18 years, absence of severe psychiatric disorders or obesity of genetic cause, in addition to a minimum post-surgical weight loss of 20%. Patients who were no longer followed by the health team were excluded.

The data collected included sociodemographic information (such as education and income), body measurements (weight and height to calculate BMI), and pre- and postoperative clinical variables. To identify weight regain, the percentage of total weight loss and the increase in relation to the lowest weight achieved after surgery (nadir weight) were used. In addition, validated psychometric instruments were used to investigate the psychological profile of the participants, including the BITE, ECAP, DASS-21 and PID-5-SF tests, aimed at detecting binge eating, personality traits and symptoms of stress, depression and anxiety.

Data collection was carried out using the Google Forms platform between May and August 2020, and all instruments used were validated for the Brazilian population. Statistical analyses were conducted using R software, starting with a descriptive characterization of the sample. Parametric and nonparametric tests, such as Student 's t-test , Mann-Whitney test, chi- square test, and Fisher's exact test, were applied according to the type and distribution of variables. Correlations were assessed using Spearman 's coefficient , and subsequently, a Poisson regression model with robust variance was adjusted to identify factors associated with weight regain, expressed as adjusted prevalence ratios.

3. Results

Information was collected from 124 people. The main information regarding the object of study is found below.

Table 1 – Frequency of Weight Regain According to Income and Education (n = 124)

Income Range	Regain: No	Regain: Yes	Total	% Total
Up to 2 minimum wages	13	8	21	21.4%
From 2 to 4 minimum wages	19	15	34	34.7%
From 4 to 10 minimum wages	22	4	26	26.5%
From 10 to 20 minimum wages	9	1	10	10.2%
No income	2	2	4	4.1%
Above 20 minimum wages	2	1	3	3.1%
Grand total	**67**	**31**	**98**	**100%**
Education	**Regain: No**	**Regain: Yes**	**Total**	**% Total**
High School Diploma	11	3	14	14.3%
Incomplete High School	2	1	3	3.1%
Complete Elementary Education	0	1	1	1.0%
Incomplete Elementary Education	1	2	3	3.1%
Incomplete Higher Education	10	7	17	17.3%
Complete Higher Education	16	2	18	18.4%
Incomplete Postgraduate Studies	5	3	8	8.2%
Complete Postgraduate Studies	22	12	34	34.7%
Grand total	**67**	**31**	**98**	**100%**

In the analysis by income, a higher frequency of weight regain was observed among participants with an income between 2 and 4 minimum wages (15 cases), followed by those with up to 2 minimum wages (8 cases). This represents more than 74% of the cases of regain concentrated in these two ranges, suggesting that lower income is associated with greater difficulty in maintaining weight loss after surgery.

Regarding education, the largest number of participants with weight regain was concentrated among those with complete postgraduate studies (12 cases) and incomplete higher education (7 cases). However, proportionally, the highest rates of weight regain occurred among those with incomplete primary and secondary education, although in smaller absolute numbers, indicating possible vulnerability in this group.

Table 2 – Relative Frequency of Psychological Indicators by Income Range and Education Level (n = 124)

Psychological Variable	Income range with highest occurrence (%)	Education with highest occurrence (%)
Depression (Moderate)	From 4 to 10 SM (6 cases = 4.2%)	Incomplete postgraduate studies (5 cases = 3.5%)
Anxiety (Severe)	From 4 to 10 SM (2 cases = 1.4%)	Incomplete postgraduate studies (3 cases = 2.1%)
Stress (Moderate)	Up to 2 SM (1 case = 0.7%)	Incomplete Higher Education (1 case = 0.7%)
Negative Affection (Severe)	No income (2 cases = 1.4%)	Incomplete postgraduate studies (2 cases = 1.4%)
Disinhibition (Severe)	From 4 to 10 SM (11 cases = 7.7%)	Complete/Incomplete Postgraduate Studies (10 cases each = 7.0%)
Psychoticism (Moderate)	From 4 to 10 SM (3 cases = 2.1%)	Incomplete postgraduate studies (4 cases = 2.8%)

The analysis of psychological variables in relation to income and education reveals relevant patterns of association that can help in understanding emotional vulnerability in the post-bariatric surgery context. It is observed that the income range between 4 and 10 minimum wages concentrates the majority of moderate or severe cases of symptoms such as depression (4.2%), anxiety (1.4%), disinhibition (7.7%) and psychoticism (2.1%). This intermediate group, although not in a situation of extreme poverty, may experience economic pressures, financial insecurity and difficulties in accessing continuous mental health care.

Regarding education, the high presence of severe or moderate symptoms among participants with incomplete postgraduate studies is noteworthy, such as depression (3.5%), anxiety (2.1%), negative affect (1.4%) and psychoticism (2.8%). Disinhibition, in turn, had the highest rate among people with complete or incomplete postgraduate studies, representing 7.0% of the sample in each subgroup. This suggests that psychological distress is not restricted to the lower social classes, but can also affect individuals with higher levels of education, possibly due to frustrations, professional pressures or high expectations regarding the success of treatment.

Moderate stress, although less prevalent, was more frequently identified among people with an income of up to 2 minimum wages (0.7%) and incomplete higher education (0.7%), which reinforces the hypothesis that economic difficulties and interrupted educational trajectories can directly impact the emotional stability of these patients.

Figure 1 – Distribution of Depression Levels by Income Group in Post-Bariatric Patients

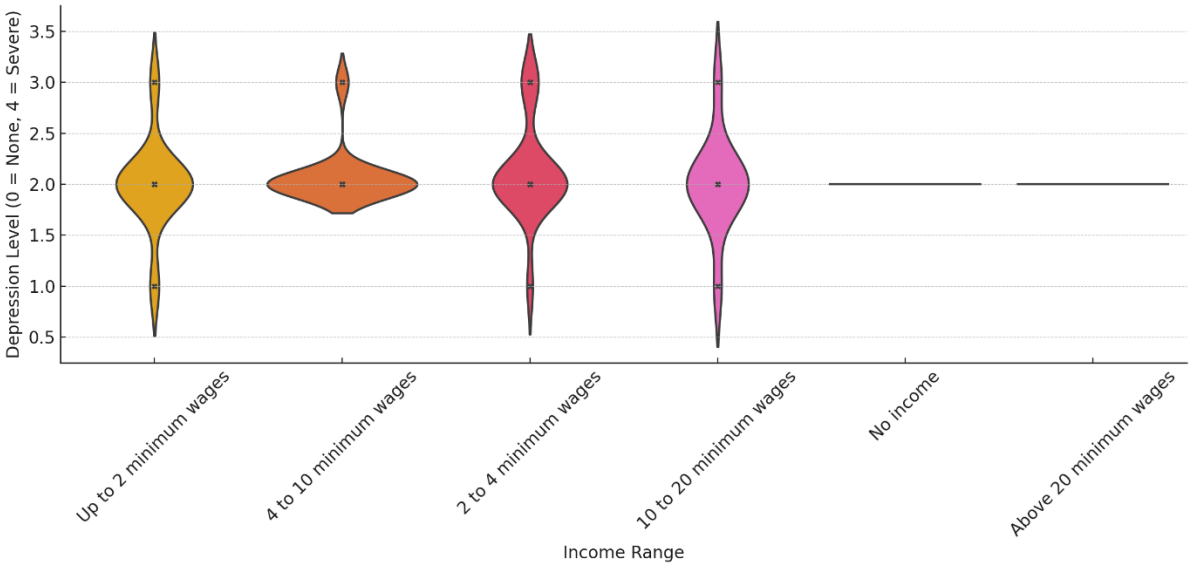

Figure 1 presents a *violin type plot plot* , which represents the distribution of depression levels (on an ordinal scale from 0 to 4) among different monthly income ranges of the study participants. The width of the " violin " indicates the density of observations at each point on the scale, while the central white markers indicate the median of each group. It can be seen that most income ranges present concentrations of mild to moderate levels of depression, with greater dispersion in income groups between 2 and 10 minimum wages. These data suggest that, although depressive symptoms are present in all economic ranges, variability and intensity tend to be greater in intermediate incomes, possibly due to psychosocial factors specific to this group.

Figure 2 – Dispersion and Mean of Anxiety Levels by Education Level in Post-Bariatric Patients

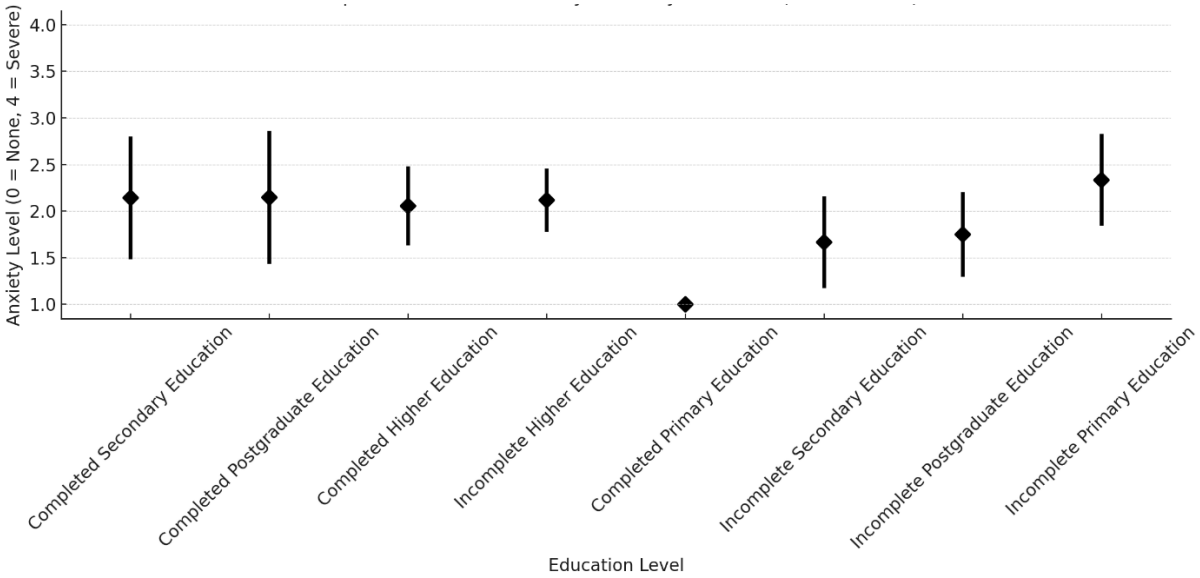

Figure 2 presents a scatterplot with mean and standard deviation range, representing the anxiety levels (on an ordinal scale from 0 to 4) among the different levels of education of patients undergoing bariatric surgery. Each black diamond marker indicates the mean score for the respective educational group, while the vertical bars represent the variability (standard deviation) around this mean. A higher mean anxiety was observed among participants with incomplete elementary education and complete postgraduate studies, indicating that both low and high levels of education may be associated with greater anxiety distress. These results suggest that education alone does not guarantee emotional protection, and that it is necessary to consider contextual and subjective factors associated with the post-surgical rehabilitation process.

4. Discussion

The results found in this study reinforce the idea that social aspects, such as education and income, play a determining role in the mental health of patients undergoing bariatric surgery. It was possible to observe that individuals with lower levels of education presented a higher frequency of symptoms of stress, anxiety and depression, in addition to personality traits that indicate greater emotional vulnerability. These findings demonstrate that the physical changes promoted by surgery do not always translate into subjective benefits, especially when the patient does not have the cognitive and social resources to face the demands of the new lifestyle.

Education level proved to be a key factor in postoperative adaptation. Patients with a higher level of education seemed to understand medical advice better, reported fewer emotional symptoms, and demonstrated greater confidence in conducting their own care process. In contrast, those with lower levels of education faced greater difficulties in understanding, presented dysfunctional eating behaviors, and reported more feelings of confusion, fear, and dissatisfaction. This suggests that the ability to understand and apply clinical advice is directly associated with educational level.

Family income also had a significant impact on the mental health of the patients analyzed. Individuals with lower purchasing power demonstrated more psychopathological symptoms, which may be related to the difficulties faced in maintaining a healthy routine, acquiring nutritional supplements or accessing

psychological support. Financial barriers make the rehabilitation process more complex, since many postoperative demands depend on resources that not all patients have. This reality increases inequalities in results after surgery.

The presence of compulsive eating behaviors was more pronounced in low-income and low-education patients. Many reported episodes of loss of control over their eating, even after significant weight loss (11) . This pattern may indicate the use of food as a way to compensate for negative emotions, such as sadness, loneliness or frustration. Compulsive eating may persist or reappear after surgery, especially in people who do not receive continuous psychological support or who live in environments with high levels of stress (12) .

The data also showed that personality traits associated with social isolation, difficulty dealing with negative emotions, and low tolerance to frustration were more common among patients in situations of greater social vulnerability (13) . These traits hinder therapeutic engagement and increase the risk of abandoning multidisciplinary follow-up. In addition, they can compromise the creation of bonds with family members, health professionals, and support networks, making it even more difficult to maintain healthy habits (14) .

Another important point was the association between symptoms of stress, anxiety and depression, which often overlap, in patients with greater vulnerability (15) . This set of symptoms directly affects the disposition, self-esteem and ability to adapt to the changes required after surgery. The lack of emotional support, combined with an unfavorable socioeconomic reality, increases the risk of behavioral relapses and impairs the clinical evolution of these individuals (16) .

Although bariatric surgery provides significant physical changes, the emotional and psychological transformation requires ongoing support. Rapid weight loss and the demands of a new lifestyle can lead to identity crises, difficulties in relationships, and frustration with the results obtained. When the patient is not prepared for these changes, or when facing external pressures, symptoms of anxiety and lack of motivation are common. Psychological support, in this sense, becomes essential.

It was also observed that dissatisfaction with one's own body image persisted even among patients who achieved significant weight loss. This reinforces the idea that body image perception does not depend solely on objective factors, but also on emotional aspects and the life history of each patient. When a patient has lived with obesity for many years and suffered discrimination, rebuilding self-esteem may require much more than simply reducing body weight.

A greater understanding of the influence of social and psychological factors in the postoperative period of bariatric surgery allows us to think of more effective forms of intervention (17) . Strategies focused on health education, accessibility to psychological services and strengthening empathetic listening should be prioritized. Multidisciplinary teams need to consider the life context of each patient, respecting their limits and offering monitoring adapted to their real conditions (18) .

It is important to highlight that the type of surgical technique used (bypass or sleeve) did not show a direct relationship with the psychological outcomes identified in this study. This indicates that subjective and social factors have a greater weight in the emotional experience of the postoperative period than the specificities of the technical procedure. Therefore, the success of the surgery must be understood from a broad perspective, which goes beyond weight loss and considers psychological well-being.

As a practical implication, this study reinforces the need to increase psychological and social support in the monitoring of bariatric patients, especially those

in vulnerable situations. Care for these patients should go beyond the clinical protocol, incorporating educational actions, active listening and interventions aimed at strengthening autonomy and self-esteem. The involvement of social workers, psychologists and educators can be decisive for the continuation of good surgical results.

Among the limitations of the study, the cross-sectional design stands out, which does not allow establishing cause-and-effect relationships. In addition, the sample consisted of patients from a single health service, which may limit the generalization of the results. Online data collection may also have generated response bias, especially on sensitive topics such as eating behavior and emotional distress. The lack of longitudinal follow-up prevents the evaluation of the evolution of symptoms over time.

5. Conclusion

The findings of this study show that education and income have a significant influence on the psychopathological profile of patients undergoing bariatric surgery, reflecting inequalities that go beyond clinical results. Individuals with lower educational levels and purchasing power presented greater emotional vulnerability, with accentuated symptoms of stress, anxiety, depression and dysfunctional eating behaviors. These data reinforce the need for an interdisciplinary and personalized approach in postoperative follow-up, which considers the social determinants of health as an essential part of care. Promoting continuous psychological support, equitable access to health services and educational strategies adapted to the life context of patients is essential to ensure not only the maintenance of weight loss, but also the comprehensive promotion of health and quality of life.

References

1. Valukas CS, Sanchez J, Vitello D, Hungness EP, Teitelbaum EN, Feinglass J. A population based study of bariatric surgery in Illinois. Surg Obes Report Dis. 2025 Jun;21(6):682–8.
2. Alhomaid A, Chauhan S, Katamreddy Y, Sidhu A, Sunkara P, Desai R. Prevalence and association of MASLD in metabolically healthy young Asian Americans with obesity: A nationwide inpatient perspective (2019). Obes Pillars. 2025 Mar;13:100168.
3. Deng L, Tao Y, Li N. Boosting Dietary Compliance After Bariatric Surgery: Winning Tactics for Patients. J Eval Clin Pract. 2025 Feb;31(1):e14317.
4. Noria SF, Pratt KJ, Abdel-Rasoul M, Diaz K, Shalash B, Abul-Khoudoud D, et al. The impact of social determinants of health (SDOH) on completing bariatric surgery at a single academic institution. Endosc Surg. 2025 Feb;39(2):1234–42.
5. Pellegrini JR, Sodoma AM, Greenberg S, Rathi S, Knott N, Pellegrini R, et al. A 13-year nationwide analysis of outcomes of non-variceal upper gastrointestinal bleeding in post-bariatric surgery patients. Transl Gastroenterol Hepatol. 2025;10:6.
6. Doan TD, Suh L, Wu M, Cherng N, Perugini R. The role of socioeconomic status in resolution of type 2 diabetes mellitus following longitudinal sleeve gastrectomy. Endosc Surg. 2025 Jan;39(1):568–76.
7. Alghalyini B, Zaidi ARZ, Faroog Z, Aljejakli M, Garad NF, Nyroze MSM, et al. Awareness and Attitudes of the Saudi Population Towards Bariatric Surgery in Saudi Arabia. Healthcare (Basel). 2024 Dec 13;12(24):2528.

8. Dicken SJ, Qamar S, Batterham RL. Who consumes ultra-processed food? A systematic review of sociodemographic determinants of ultra-processed food consumption from nationally representative samples. Nutr Res Rev. 2024 Dec;37(2):416–56.
9. Ifeanyichi M, Mosso Lara JL, Tenkorang P, Kebede MA, Bognini M, Abdelhabeeb AN, et al. Cost-effectiveness of surgical interventions in low-income and middle-income countries: a systematic review and critical analysis of recent evidence. BMJ Glob Health. 2024 Oct 3;9(10):e016439.
10. Malhotra A, Heilmann CR, Banerjee KK, Dunn JP, Bunck MC, Bednarik J. Weight reduction and the impact on apnea-hypopnea index: A systematic meta-analysis. Sleep Med. 2024 Sep;121:26–31.
11. Raphelson JR, Schmickl CN, Sonners C, Kreitinger K, Grunvald E, Horgan S, et al. Obesity Hypoventilation Syndrome and Postsurgical Outcomes in a Bariatric Surgery Cohort. Obes Surg. 2022 Jul;32(7):1–7.
12. Althumiri NA, BinDhim NF, Aldabaeab AE, AlMousa N, Aljabbary RA, Alumran A. Comparing Lifestyle and Behavior of Post-Bariatric Surgery and Participants with Obesity: A Community-Based Cross-Sectional Study. Diabetes Metab Syndr Obes. 2024;17:31–44.
13. Lum KY, Oppong R, Kigozi J. Economic Evaluation of Type 2 Diabetes Mellitus Interventions in Low- and Middle-Income Countries: A Systematic Review of the Literature. Asia Pac J Public Health. 2022 Nov;34(8):752–60.
14. Wallén S, Szabo E, Palmetun-Ekbäck M, Näslund I, Ottosson J, Näslund E, et al. Impact of socioeconomic status on new chronic opioid use after gastric bypass surgery. Surg Obes Report Dis. 2023 Dec;19(12):1375–81.
15. Bouchard ME, Tian Y, Linton S, De Boer C, O'Connor A, Ghomrawi H, et al. Utilization Trends and Disparities in Adolescent Bariatric Surgery in the United States 2009-2017. Child Obes. 2022 Apr;18(3):188–96.
16. Schlottmann F, Baz C, Pirzada A, Masrur MA. Postoperative Follow-up Compliance: The Achilles' Heel of Bariatric Surgery. Obes Surg. 2023 Sep;33(9):2945–8.
17. Alsulami I, Fathaldin A, Alghamdi T, Saud F, Binyamin S, Alghamdi Y, et al. Prevalence of Dumping Syndrome and Its Determinants Among Post-Bariatric Surgery Adult Patients at King Fahad General Hospital, Jeddah, 2019-2020. Cureus. 2022 Dec;14(12):e32630.
18. Drewnowski A, Hong BD, Shen E, Ji M, Paz SR, Bhakta BB, et al. Neighborhood deprivation and residential property values do not affect weight loss at 1 or 3 years after bariatric surgery. Obesity (Silver Spring). 2023 Feb;31(2):545–52.