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Impact-Factor Concentration and Citation Disparities: GLP-1 Literature Outperforms Bariatric Surgery Through Preferential Placement in High-Impact Journals

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Abstract

Introduction:

Glucagon-like peptide-1 receptor agonists (GLP-1RA) and metabolic bariatric surgery (MBS) are the two dominant therapies reshaping obesity and metabolic care. Although both have produced highly cited evidence, it remains unclear whether differences in bibliometric influence reflect scientific merit or systematic publication in higher-impact journals.

Methods

Two independent bibliometric exports were analyzed using *Bibliometrix*. We compared the 100 most-cited GLP-1RA articles with the 100 most-cited MBS articles, focusing on citation density, journal distribution, and weighted 5-year impact-factor (IF) profiles to test whether GLP-1RA research benefits from a “prestige-journal effect.” Journals were identified for all 200 original articles (abstracts, review and other types of articles were excluded), and publicly available data were retrieved for every journal. A weighted mean IF was calculated by multiplying each journal’s IF by its number of included articles and dividing by 100. Comparative analyses examined citation density, temporal trends, and journal prestige differences across both corpora.

Results

Both corpora contained 100 articles. GLP-1 papers accumulated 91,660 citations versus 72,243 for MBS. Median citations were higher for GLP-1 (718 vs 551). International collaboration was more common in GLP-1RA articles (57% vs 26%). Weighted 5-year IF analysis across all journals in both corpora showed higher IF for GLP-1RA (35.4) than for MBS (21.6). 41% of GLP-1RA articles were published in journals with IF > 40, compared with 25% in MBS. GLP-1RA’s most-cited trials appeared in *NEJM* or *Lancet*, whereas MBS’s high-impact studies were diluted by a larger fraction of publications in surgical journals.

Conclusion

GLP-1RA literature demonstrates markedly higher citation density and greater representation in high-impact journals. This reinforces the need to interpret citation-based comparisons considering journal-impact inequalities between therapeutic domains.

Introduction

Obesity has established itself as one of the most complex public health challenges of the 21st century, demanding a continuous evolution of therapeutic strategies. For decades, Metabolic Bariatric Surgery (MBS) has been regarded as one of the most effective therapeutic interventions for severe obesity,

providing sustained weight reduction and improvement of obesity-associated medical problems through permanent anatomical and physiological modifications. (1, 2) However, the last decade has witnessed a pharmacological revolution with the advent of glucagon-like peptide-1 receptor agonists (GLP-1 RAs). While surgical intervention represents a definitive mechanical and hormonal adjustment, GLP-1 RAs offer a potent, non-invasive systemic alternative, effectively redefining the boundaries between clinical and surgical management. (3)

Currently, obesity treatment has transcended specialized niches to become a multidisciplinary effort grounded in shared decision-making between the patient and various medical specialties. Recent data indicate that GLP-1 analogues have expanded significantly beyond endocrinology, with primary care physicians now responsible for more than 50% of global prescriptions. (4, 5) This massive adoption by non-surgeons is drastically altering traditional referral pathways; evidence shows that while GLP-1 RA use among surgery-eligible patients has surged, MBS procedure rates have experienced a concomitant decline of 25% to 46%. (6, 7)

This paradigm shift may be influenced by publication dynamics. Specialists such as cardiologists and family physicians frequently base their decision algorithms on guidelines and evidence published in high-impact generalist journals.(8) If the literature in these elite venues disproportionately highlights one therapeutic modality over another, it may create a bias in the perception of clinical superiority, directly impacting the final shared-treatment choice.

Therefore, the objective of this study is to perform a comparative bibliometric analysis of the 100 most-cited articles in each field, GLP-1RA vs. Metabolic Bariatric Surgery, to evaluate how publication distribution and the "prestige-journal effect" shape contemporary clinical practice and the visibility of surgical versus pharmacological interventions.

Methods

We conducted a bibliometric analysis using the Web of Science Core Collection, with data extracted on May 15, 2025. Two independent topic-specific searches were performed to identify the most influential literature in (1) glucagon-like peptide-1 receptor agonists (GLP-1 RA) and (2) bariatric/metabolic surgery for obesity and diabetes. Search strategies included relevant title terms and established variants for each field, followed by ranking publications according to global citation count.

For the present comparative analysis, the 100 most-cited original articles from each corpus were included (total n = 200). Review articles, editorials, letters, conference abstracts, and non-original publications were excluded to enhance comparability between therapeutic domains. Data were exported into Bibliometrix/Biblioshiny (R package) for structured bibliometric assessment. Extracted variables included publication year, document type, total citations, citations per year, authorship patterns, international collaboration, contributing institutions, countries of author affiliation, and journal source. (Fig. 1)

To evaluate publication venue disparities, journals were identified for all included studies, and publicly available 5-year journal impact factors (IFs) were retrieved. A weighted mean IF was calculated for each corpus by multiplying the journal IF by the number of included articles published in that journal and dividing by 100. Comparative analyses focused on citation density, temporal trends, country representation, authorship concentration, and journal prestige profiles between GLP-1 and metabolic bariatric surgery literature.

Country productivity analyses were based on frequency of appearance in author affiliations, reflecting multinational collaboration rather than unique article counts. Citation distribution metrics included mean, median, percentile values (P25, P75, P90, P95), and annualized citation rates. Results were summarized descriptively to assess whether differences in bibliometric influence were associated with scientific output alone or with preferential placement in higher-impact journals.

Results

3.1 Overall Citation Performance and Influence Profile

A total of 200 highly cited original articles were analyzed, including the 100 most-cited GLP-1 publications and the 100 most-cited bariatric surgery publications. Collectively, the GLP-1 corpus accumulated 91,660 citations, substantially exceeding the 72,243 citations observed in the bariatric surgery corpus. Mean citations per article were correspondingly higher for GLP-1 studies (916.6 vs 722.4), with a similar pattern seen for median citations (718.5 vs 551.5), indicating consistently greater bibliometric influence rather than dependence on isolated landmark papers.

The upper citation tail was also more pronounced among GLP-1 studies. The 90th percentile citation count reached 1,583 for GLP-1 compared with 1,224 for bariatric surgery, while the most cited GLP-1 article accrued 6,185 citations, nearly double the top bariatric article (3,455 citations). When adjusting for publication age using citations per year, GLP-1 literature maintained a marked advantage, with mean annual citation rates of 90.7 vs 50.0 and median annual rates of 46.3 vs 36.0, respectively. These findings suggest that GLP-1 literature has not only accumulated greater historical influence but also demonstrates stronger contemporary citation momentum. (Table 1)

3.2 Journal Prestige and Publication Venue Concentration

Substantial disparities were observed in publication venue profiles between therapeutic domains. GLP-1 articles were predominantly concentrated in elite general medicine and endocrine journals, including Lancet (16 articles), New England Journal of Medicine (15), JAMA, Diabetes Care, and Nature Medicine. In contrast, bariatric surgery publications were more commonly clustered in specialty surgical journals such as Obesity Surgery (20 articles), Annals of Surgery (15), and Surgery for Obesity and Related Diseases, although high-impact general journals such as NEJM and JAMA also contributed to major landmark studies.

When weighted by article frequency, the mean 5-year journal impact factor was substantially higher for GLP-1 literature (35.4) than for bariatric surgery (21.6). 41% of GLP-1RA articles were published in journals with IF >40, compared with 25% in bariatric surgery. (Table 2)

3.3 Temporal Evolution of Landmark Literature

The two corpora demonstrated distinct historical trajectories. Bariatric surgery literature displayed an earlier maturation curve, with highly cited landmark publications dating back to the late 1960s and strong representation during the 2000s and 2010s. In contrast, GLP-1 literature emerged later but expanded more explosively, particularly from the 2010s onward. Notably, 14% of the GLP-1 top-100 corpus originated from the 2020s, compared with only 3% of bariatric surgery articles. This recent acceleration likely reflects the rapid uptake of semaglutide-, tirzepatide-, and cardiovascular outcomes-based trials, which reshaped obesity therapeutics within a short timeframe.

3.4 Collaboration Networks and Research Scale

GLP-1 literature showed a more collaborative publication model. Across the top-100 studies, GLP-1 articles involved 923 authors, compared with 730 authors in bariatric surgery. Mean co-authors per manuscript were higher for GLP-1 (11.2 vs 10.2), and international co-authorship was more than doubled (57% vs 26%).

3.5 Geographic Leadership and Global Representation

The United States was the leading contributor in both domains, appearing in author affiliations 271 times in GLP-1 literature and 412 times in bariatric surgery literature. However, geographic patterns beyond the United States differed substantially. Overall, both corpora remained heavily concentrated in high-income nations, with relatively limited representation from low- and middle-income countries despite the global burden of obesity and diabetes. (Table 2)

Table 1. Overall bibliometric indicators (Top 100 GLP-1 RA vs top 100 Bariatric Surgery)

Metric	GLP-1 RA	Bariatric surgery
Total citations	91,660	72,243
Mean citations	916.6	722.4
Median citations	718.5	551.5
Minimum	489	361
Maximum	6,185	3,455
25th percentile (P25)	578.3	439.0
75th percentile (P75)	965.3	749.3
90th percentile (P90)	1,583.3	1,223.7
95th percentile (P95)	1,821.9	1,802.7
Mean citations per year	90.7	50.0
Median citations per year	46.3	36.0
75th percentile TC/year	83.0	62.4
90th percentile TC/year	180.8	99.0
Mean Impact Factor	35.4	21.6

Table 2. Comparative Journal and Geographic Disparities between GLP-1 RA and Bariatric Surgery Literature

	Top Journal				Top Country			
Rank	**GLP-1 RA**	**n**	**Bariatric Surgery**	**n**	**GLP-1 RA**	**n**	**Bariatric Surgery**	**n**
1	The Lancet	16	Obesity Surgery	20	USA	271	USA	412
2	NEJM	15	Annals of Surgery	15	UK	110	Sweden	60
3	Diabetes Care	5	NEJM	14	Denmark	106	Switzerland	30
4	Endocrinology	5	JAMA	11	Canada	76	France	26
5	JAMA	5	Cell Metabolism	3	Germany	31	Italy	19
6	Nature Medicine	5	SOARD	3	Japan	20	UK	17
7	Diabetes	4	Archives of Surgery	2	Switzerland	14	Australia	16
8	Journal of Bio Chemistry	3	Gastroenterology	2	Italy	13	Finland	16
9	J of Clinical Endo & Metabolism	3	JAMA Surgery	2	Sweden	12	Denmark	13
10	Journal of Clinical Investigation	3	J of Clinical Endo & Metabolism	2	Spain	10	Germany	13

Abbreviations: GLP-1 RA, glucagon-like peptide-1 receptor agonist; n, number of articles/frequencies; NEJM, New England Journal of Medicine; JAMA, Journal of the American Medical Association; SOARD, Surgery for Obesity and Related Diseases; J of Clinical Endo & Metabolism, Journal of Clinical Endocrinology & Metabolism.

Discussion

Our bibliometric analysis reveals a substantial and systematic disparity in the literature regarding obesity treatments, where articles on GLP-1 RAs demonstrate higher citation density and dominant representation in high-impact journals compared to bariatric surgery research. This divergence is further driven by the structural nature of the research models. Our results highlight a significant gap in global integration: GLP-1 studies exhibited a 57% international collaboration rate. In contrast, bariatric research showed a much narrower 26% collaboration rate. Such extensive multi-national backing in the GLP-1 corpus, typical of industry-sponsored multicenter trials, likely facilitates placement in elite journals, creating a self-perpetuating cycle where high visibility generates disproportionately high citation volumes.

A critical paradox emerges when comparing these bibliometric metrics to real-world clinical utility. While GLP-1 RAs dominate the academic discourse, their practical application faces significant hurdles. Real-world data indicate that discontinuation rates for GLP-1 RAs are alarmingly high, with persistence rates often dropping to as low as 15% in observational cohorts by the second year. (9) This contrasts sharply with the 83–88% persistence seen in controlled clinical trials.(1) The primary barriers identified, including annual costs and some gastrointestinal intolerance, which affects nearly 15% of patients, suggest that the "citation clout" of these drugs may be overshadowing the practical difficulties of maintaining long-term therapy. (9,10) Moreover, clinical evidence demonstrates that patients who discontinue GLP-1 RAs experience significant weight regain. (11,12)

In stark contrast, bariatric surgery remains the clinical gold standard for profound and sustained metabolic outcomes, despite its more compartmentalized bibliometric footprint. Metabolic surgery achieves a total weight loss of 25–30% that is maintained long-term, independent of daily medication adherence. (13,14) While GLP-1 RAs show impressive short-term trial results, head-to-head network meta-analyses prove that surgery results in significantly superior reductions in total weight loss (an average difference of -10.3%), BMI, and HbA1c levels.(15) The durability of these outcomes is well-documented; for instance, metabolic surgery achieves diabetes remission rates exceeding 80% at one year, with a significant proportion of patients maintaining glycemic control for over eight years. (16,17)

The practical implications of this bibliometric asymmetry are significant for both clinical decision-making and health policy. The concentration of GLP-1 data in generalist journals may inadvertently bias non-specialist clinicians toward pharmacological solutions. This is concerning given that established guidelines from the American Diabetes Association (ADA) and the American Heart Association (AHA) continue to emphasize metabolic surgery as a highly effective intervention for type 2 diabetes remission and the reduction of major adverse cardiovascular events (MACE). (16,18) Analysis of hard clinical endpoints shows that surgery achieves superior reductions in cardiovascular risk factors compared to medical interventions (14,18), yet these findings struggle to reach the same citation peaks as novel drug trials.

In conclusion, our analysis demonstrates that the GLP-1 receptor agonist literature benefits from a formidable bibliometric advantage driven by global collaboration and preferential placement in high-prestige journals (weighted IF of 35.4). However, this "prestige-journal effect" risks overshadowing the irreplaceable role of bariatric surgery. While academic enthusiasm currently favors pharmacological innovation, real-world data on high discontinuation rates and the superior durability of surgical interventions reaffirm that surgery remains the undisputed gold standard for sustainable metabolic health. (9,13,15) The medical community must remain cognizant of these publication dynamics to ensure that citation volumes do not prematurely distort clinical guidelines at the expense of established surgical excellence.

Declarations

Statement of Ethics

Ethical approval was not required for this study because it was a bibliometric analysis based exclusively on publicly available, non-identifiable metadata retrieved from the Clarivate Web of Science database and analyzed using Bibliometrix. No human participants, patient data, biological samples, or confidential information were involved; therefore, institutional review board and informed consent were not applicable.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

RP and IA conceptualized the study, performed data acquisition, analyzed the data, and drafted the initial manuscript. AC, MC, AK, RPt, SAF, and RSL critically reviewed the manuscript for important intellectual content and contributed to revisions. All authors approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Data Availability Statement:

The data supporting the findings of this study were derived from the Clarivate Web of Science Core Collection database. Bibliographic records and citation metadata were accessed through an institutional subscription and analyzed using Bibliometrix. The processed dataset generated during the current study and the search strategy used for data retrieval are available from the corresponding author upon reasonable request. Access to the original raw records may require an active subscription to the Web of Science platform.

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Figures

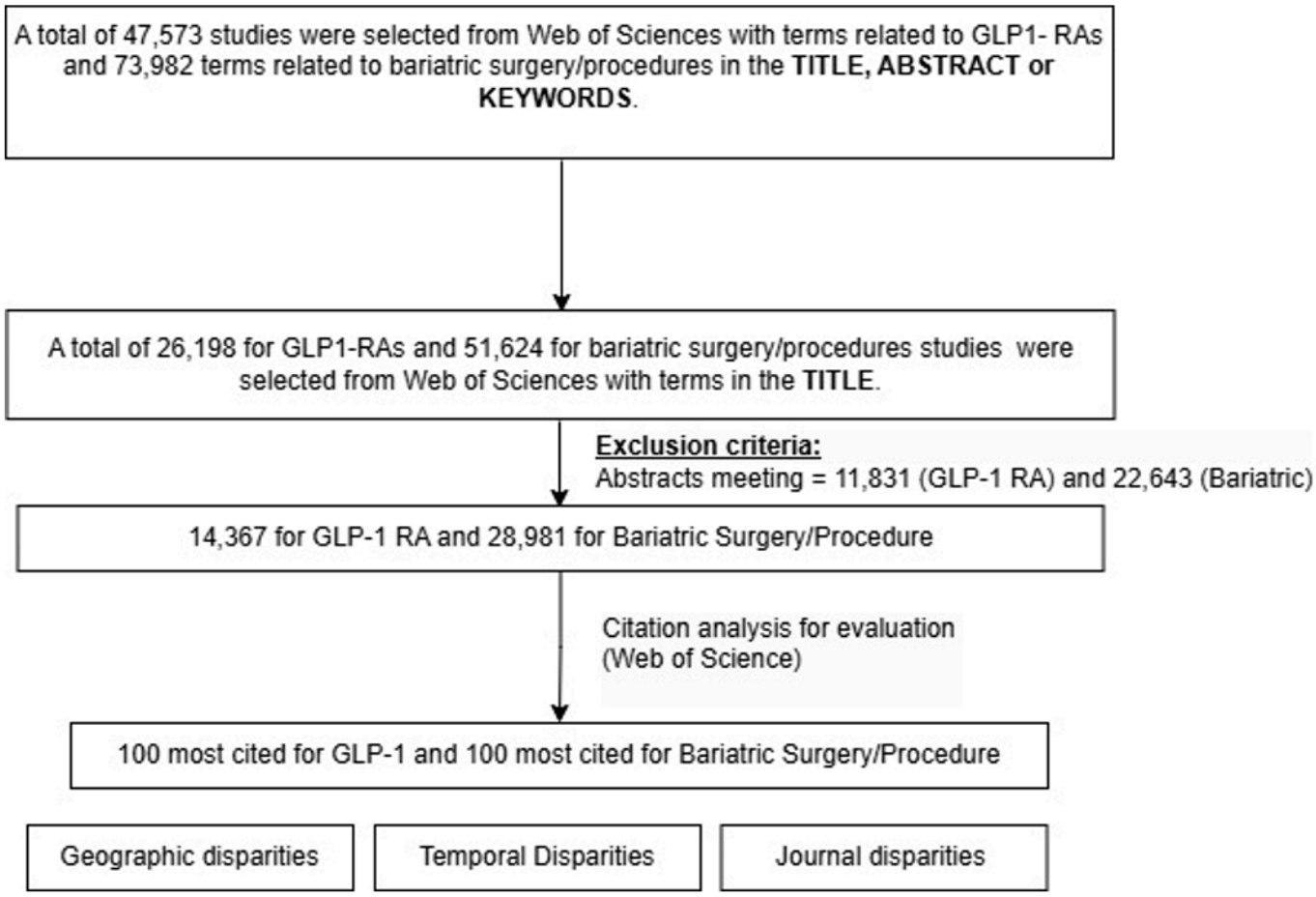

Figure 1

Flow diagram of study methodology