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Bariatric Surgery, Employment, and Productivity Outcomes
A Systematic Review

Qing Xia, PhD; Thomasina Donovan, PhD; Jiahao Diao, PhD; Xiao Yang, MMed; Xingzhong Jin, PhD; Stella T. Lartey, PhD; Hannah E. Carter, PhD

IMPORTANCE Bariatric surgery is widely recognized for its health benefits; however, its association with work productivity and employment participation, though frequently reported, has not been systematically synthesized. This evidence is crucial to inform the economic evaluation of bariatric surgery.

OBJECTIVE To systematically analyze the evidence on occupational outcomes of bariatric surgery.

EVIDENCE REVIEW A systematic literature search was conducted in 5 online databases to identify empirical studies on bariatric surgery–related employment and productivity outcomes published up to April 2024. Two coauthors independently screened the literature, and all coauthors contributed to data extraction and validation. Differences in occupational outcomes were compared before vs after surgery and between surgery vs nonsurgery groups. Comparisons were categorized into 3 groups: improvement, no difference, and worse. Where possible, summary values of occupational outcomes (eg, the average employment rate) were synthesized for each observational time point. Reported barriers and enablers to employment return or productivity were also identified.

FINDINGS A total of 42 studies from 15 countries were included. Studies were published between 1977 and 2023, with most conducted in high-income countries. Roux-en-Y gastric bypass was the most frequently studied procedure. The most commonly evaluated metrics were employment and unemployment rates and absenteeism and sick leave. Bariatric surgery was associated with improvements in presenteeism and work hours and ability and short-term absenteeism and employment rates. However, the long-term employment rate followed a reversed U-shape trajectory, with employment rates initially increasing postsurgery but returning to baseline levels after about 5 years. Key barriers to improved occupational outcomes included insufficient weight loss, female sex, older age, preoperative comorbidities, lower quality of life, and a lack of prior work experience.

CONCLUSIONS AND RELEVANCE Bariatric surgery demonstrates positive short-term impact on productivity and employment, but its long-term occupational benefits remain uncertain. Certain subgroups, such as females and older adults, may require tailored postsurgery support to sustain employment and productivity gains. These findings highlight the critical need for long-term strategies to sustain the occupational benefits postsurgery and to develop targeted interventions for at-risk populations.

Supplemental content

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Author Affiliations: Author affiliations are listed at the end of this article.

Corresponding Author: Qing Xia, Australian Centre for Health Services Innovation and Centre for Healthcare Transformation, School of Public Health and Social Work, Faculty of Health, Queensland University of Technology, 60 Musk Avenue, Kelvin Grove, Brisbane 4059, Queensland, Australia (qing.xia@qut.edu.au).

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Bariatric (metabolic or weight-loss) surgery is widely recognized as the most clinically effective intervention for severe and resistant obesity.[1,2] Beyond its immediate health benefits, bariatric surgery also holds the potential to alleviate the societal economic burden of obesity, particularly by reducing the indirect, productivity-related costs associated with morbidity and premature mortality.[3] Cost-effectiveness investigations of bariatric surgery highlight its long-term economic values in managing patients with morbid obesity, especially those with type 2 diabetes[3]; however, these findings have primarily been analyzed from a health care system perspective that excludes productivity impact.[3]

Comprehensive reviews of health economic evaluations indicate that the adoption of a broader societal perspective has the potential to modify the cost-effectiveness results as well as the conclusions regarding implementation, when compared with a more narrowly defined health system perspective.[4-7] Unfortunately, many economic evaluations do not account for societal costs, in particular productivity costs, because of practical challenges in their estimation, such as the quantification of presenteeism.[8-10] This lack of information limits the ability of health care decision-makers to make fully informed decisions from a societal perspective, especially given the wide-ranging impact of obesity and its associated comorbidities.

Numerous studies have explored the impact of bariatric surgery on occupational outcomes such as employment status, return to work (RTW), absenteeism (sick leave), and presenteeism; however, results have been mixed, particularly regarding the surgery's impact on patients' employment status.[11-14] This review aims to synthesize the evidence on the impact of bariatric surgery on employment and productivity. These findings may be useful in providing a comprehensive summary of societal cost inputs for future economic evaluations of obesity interventions.

Key Points

Question What is the impact of bariatric surgery on employment and productivity outcomes?

Findings In this systematic review of 42 studies, bariatric surgery demonstrates positive impact on work productivity and short-term work return. However, the long-term employment rate followed a reversed U-shape trajectory, with the rate initially increasing postsurgery but returning to baseline levels after about 5 years.

Meaning Bariatric surgery offers broad economic and social benefits above and beyond its immediate health benefits, but the long-term sustainability of these outcomes remains uncertain, indicating a need for research into effective postsurgical support strategies and the societal value of long-term investment.

Methods

The protocol was registered in PROSPERO (CRD42023397967). This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting guideline.[15]

Systematic Literature Search

A comprehensive literature search was conducted using 3 biomedical databases (MEDLINE, Embase, and Scopus) and 2 economic databases (EconLit and the Centre for Reviews and Dissemination). The initial search was conducted on February 13, 2023, with an updated search on April 6, 2024.

Search strategies were developed in consultation with a research librarian at the Queensland University of Technology. The search terms included (1) bariatric metabolic surgery, and (2) occupational outcomes, including (un)employment rate, RTW, sick leave, absenteeism, presenteeism, and work ability. Detailed strategies for all databases are available in the eTable 1 in Supplement 2.

The inclusion criteria were the following:

- Empirical research studies published as full text, with no restrictions placed on study setting, language, or time of publication.
- Patients with obesity (body mass index [BMI] ≥30, calculated as weight in kilograms divided by height in meters squared) who were at least 18 years old and had a history of any form of bariatric surgery.
- The intervention was any type of bariatric surgery, such as Roux-en-Y gastric bypass (RYGB), adjustable gastric banding (AGB), or sleeve gastrectomy (SG).
- The comparison made in the study was occupational difference between surgery and nonsurgery or occupational changes before vs after surgery.
- Primary outcomes included bariatric surgery–related employment status (ie, employment rate, percentage RTW, and percentage with disability pension) or productivity (ie, absenteeism/sick leave, presenteeism, work impairment, and work hours and incomes). The secondary outcomes were reported enablers or barriers influencing occupational outcomes.

For multiple articles referring to the same study population, the most recent publication with the largest sample size was retained.

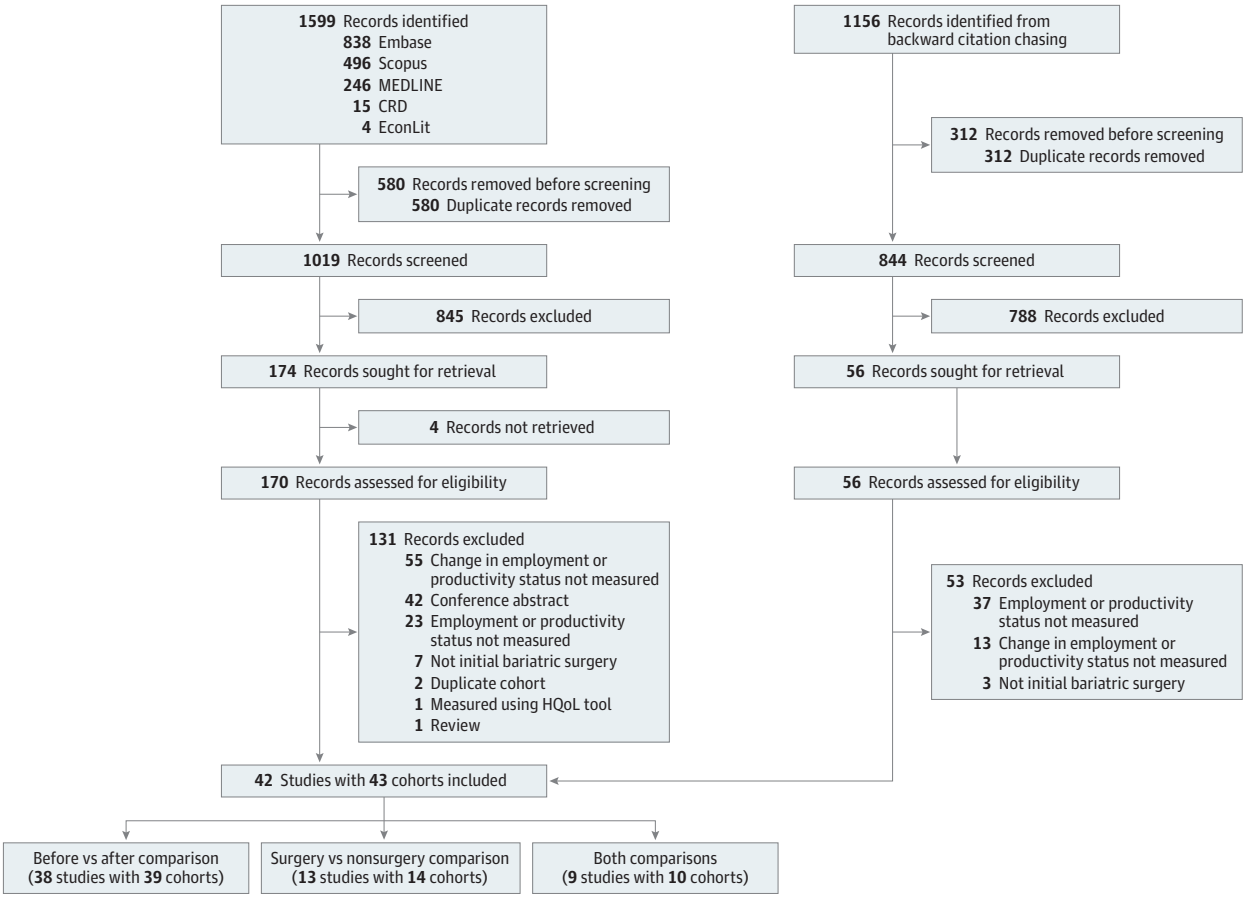
Studies were excluded if they:

- Investigated patients who were seeking bariatric surgery, on a waiting list, or underwent revisional bariatric surgery or body-contouring surgeries.[16]
- Did not report on occupational status changes related to bariatric surgery or had no information to calculate requisite data.[17]
- Considered presurgery productivity/employment status as a predictor for postsurgical effectiveness such as weight loss and regain.[18]
- Collected productivity/employment outcomes indirectly as part of an instrument such as a health-related quality-of-life assessment tool.[19]
- Were systematic reviews, meta-analyses, protocols, conference abstracts, comments/editorials, letters, or case reports.

Study Selection

Study screening and selection were conducted using a web and mobile app for systematic reviews (Rayyan). Retrieved studies were screened for inclusion in a 2-step process: initial screening was performed based on titles and abstracts to check for inclusion eligibility, and marked include, exclude, or unsure; this was followed by in-depth screening to identify articles meeting eligibility criteria by reviewing full-text copies of each publication. Two reviewers (Q.X. and T.D.) independently screened and compared results, with any remaining discrepancies resolved by consensus.

Figure 1. Flowchart of Study Selection Process



To ensure literature saturation, a keyword search of Google Scholar and backward-citation searching of all selected articles and relevant reviews were scrutinized to obtain additional eligible publications and to ensure the comprehensiveness of the search.

Data Extraction

To ensure the accuracy of data extraction, a data collection form was initially used to extract data from 10% of studies. Then, 4 reviewers (T.D., J.D., X.Y., and X.J.) independently extracted data using the improved form, with another reviewer (Q.X.) responsible for final data quality. Discrepancies were resolved during consensus meetings involving another 2 coauthors (S.T.L. and H.E.C.). All 7 coauthors were involved in the final data checking and validation from December 2024 to January 2025.

The list of extracted data is displayed in eTable 2 in Supplement 2. Where studies did not report requisite employment status data, corresponding authors were contacted with a request for further information.

Data Analysis

A narrative review was conducted to comprehensively summarize the study characteristics. The changes in occupational outcomes in both before vs after and surgery vs nonsurgery comparisons were categorized into 3 groups: improvement, no difference, and worse. If multiple follow-up periods applied, the findings were determined based on the longest follow-up time. Where possible, occupational outcomes (eg, employment rate) were synthesized and reported as average values by observational periods via line charts. Any reported barriers and enablers (both significant and nonsignificant factors) relating to employment return or productivity were identified and summarized in bar charts. Subgroup analysis by surgery type was also conducted. A risk-of-bias assessment was not conducted because of heterogeneity in study designs and lack of a standardized quality assessment tool for studies examining productivity or employment impact.

Results

Eligible Studies

The electronic database search yielded a total of 1599 records, from which 580 duplicates were removed (**Figure 1**). Of the remaining 1019 records, 845 were excluded in the title/abstract screening, leaving 174 for full-text screening. A total of 1156 additional records were identified through backward citation chasing, and 56 of them were eligible for full-text screening. Following a review of the full text of the remaining 230 records, 180 records were excluded, resulting in the final analysis of 42 studies with 43 cohorts.[11-14,20-57] One study from Sweden investigated employment outcomes for 2 distinct cohorts: a BMI-matched cohort and a sister-matched cohort.[43] As the

outcomes were reported separately for each group, we treated them as independent cohorts in our analysis. Therefore, this review included 42 studies comprising 43 cohorts. The list of included studies is displayed in eTable 3 in Supplement 2.

Study Characteristics

Table 1 summarizes the characteristics of the included studies (full details in eTable 4 in Supplement 2). The included articles were published between 1977 and 2023 across 15 countries, with 61.9% published in 2010 and onwards. Except for 2 studies from developing settings (Brazil),[12,57] all were conducted in high-income countries in Europe (n = 29), North America (n = 10), and Australia (n = 1). Gastric bypass was the most frequently investigated surgery type (n = 32, with 18 primarily focused on this procedure). While vertical banded gastroplasty was frequently investigated before 2012, there was a trend toward SG after 2015, but with limited sample sizes and no study specifically focusing on the SG procedure.

A total of 159 678 patients were included in the analysis. The sample size for each study ranged from 21 to 54 681, with 38.1% of studies having a sample size of 100 or fewer patients. European studies typically included larger sample sizes, with 13 of 14 studies reporting samples larger than 500. Study populations were heterogeneous regarding demographic and clinical characteristics. The mean age ranged from 32.4 to 49.9 years, and most participants were female in all studies (ranging from 54.9% to 100%). The mean baseline BMI ranged from 37.0 to 56.8. Only 7 studies clearly mentioned the exclusion of "retired" participants from the enrolment or data analysis. Overall, the follow-up times ranged from 0.6 to 20 years.

Occupational outcomes were reported as primary outcomes in 31 studies. Despite inconsistent reporting of occupational outcomes, unemployment and employment rates and absenteeism/sick leave were the most reported. These data were mostly collected through a self-administered questionnaire (n = 22), followed by surgery registry (n = 9) and medical database (n = 6).

Before vs after comparisons were reported in 38 studies, surgery versus nonsurgery comparisons in 13 studies, and both comparisons in 9 studies (Table 1 and eTable 3 in Supplement 2).

Occupational Outcomes Before vs After Surgery

Overall, 38 studies with 39 comparisons investigated occupational outcomes before vs after surgery. The results were summarized in **Table 2** and eFigure 1A in Supplement 1, with full details in eTable 5 in Supplement 2.

Employment Status

Among the 29 comparisons for employment rates, 14 concluded positive changes, 13 showed no change, and 2 reported negative changes. Positive changes were primarily reported in earlier studies with relatively shorter follow-up times and smaller sizes. Of particular note, among the 13 studies indicating no changes in employment rates, 4 recent studies indicated a short-term positive effect that diminished over longer follow-up periods.[11,13,30,44] Two of these studies observed similar short-term improvements in unemployment status after bariatric surgery.[11,30]

Figure 2 depicts the trajectory of employment and unemployment rates after bariatric surgery, based on pooled results from 27 studies. These findings suggested a substantial improvement in overall short-term employment rates, from 54.4% at baseline to 66.4%

Table 1. Summary of Study Characteristics (N = 42)

Characteristic	No. of studies (%)
Decade of study	
1970s	1 (2.4)
1980s	0
1990s	8 (19.0)
2000s	7 (16.7)
2010s	15 (35.7)
2020s	11 (26.2)
Country	
Europe	29 (69.0)
Sweden	6 (14.3)
United Kingdom	4 (9.5)
Denmark	3 (7.1)
France	3 (7.1)
Norway	3 (7.1)
Germany	3 (7.2)
The Netherlands	3 (7.1)
Belgium	1 (2.4)
Greece	1 (2.4)
Italy	1 (2.4)
Switzerland	1 (2.4)
North America	10 (23.8)
United States	8 (19.0)
Canada	2 (4.8)
South America (Brazil)	2 (4.8)
Australia	1 (2.4)
Journal	
Obesity Surgery	18 (42.9)
Surgery for Obesity and Related Diseases	4 (9.5)
International Journal of Obesity	3 (7.1)
American Journal of Clinical Nutrition	2 (4.8)
Other journals	15 (35.7)
Surgery type	
RYGB	18 (42.9)
Mixed procedures	14 (13 RYGB and 8 SG) (33.3)
VBG	4 (9.5)
GB	2 (4.8)
DS	1 (2.4)
SG	0
Not clear	3 (7.1)
Participant characteristics at baseline	
Age, mean range, y	32.4-49.9
Female, %	54.9-100
BMI range[a]	37.0-56.8
Sample size, overall (No. in Europe/North America/South America/Australia) [%]	
≤100	16 (10/5/1/0) [38.1]
<100-500	12 (6/4/1/1) [28.6]
<500-1000	5 (5/0/0/0) [11.9]
<1000-5000	3 (2/1/0/0) [7.1]
>5000	6 (6/0/0/0) [14.3]
Comparison type[b]	
Before vs after	38 (90.5)

(continued)

Table 1. Summary of Study Characteristics (N = 42) (continued)

Characteristic	No. of studies (%)
Surgery vs control	13 (31.0)
Both	9 (21.4)
Occupational outcomes[b]	
Employed	32 (76.2)
Unemployed	19 (45.2)
Return to work	4 (9.5)
Absenteeism, sick leave	10 (23.8)
Presenteeism, work ability, impairment	6 (14.3)
Work hours, incomes, earnings	6 (14.3)
Disability pension, state benefits	8 (19.0)

Abbreviations: BMI, body mass index; DS, duodenal switch; GB, gastric banding; NA, not applicable; RYGB: Roux-en-Y gastric bypass; SG, sleeve gastrectomy; VBG, vertical banded gastroplasty.

[a] Calculated as weight in kilograms divided by height in meters squared.

[b] Percentage exceeds 100% because categories were nonexclusive.

at the first year after surgery, remaining stable until the fourth year before slightly decreasing by the fifth year postsurgery. Similarly, the pooled results of unemployment rates echo this trend where the unemployment rates decreased from 38.8% to 34.0% in the first year and 27.6% in the second year postsurgery but returned to the baseline level at the fifth year. Given the smaller number of studies contributing data at year 5, these long-term trends should be interpreted with caution, considering the limited data and heterogeneity among studies.

Return to Work

All 3 unemployment cohorts investigating RTW outcomes indicated an improvement in job participation postsurgery. Wagner et al[55] found that 37% of patients with morbid obesity and Medicaid coverage returned to work after RYGB at a mean follow-up of 44 months. Turchiano et al[50] reported that bariatric surgery facilitated full-time employment for previously unemployed patients with obesity, with 24% becoming gainfully employed postsurgery. Claassen et al[22] showed that more than a third of previously unemployed patients were employed 1 year after surgery.

Short-Term Work Loss (Absenteeism, Sick Leave, Work Hours, and Incomes)

Among 10 comparisons for absenteeism/sick leave, 5 showed a decrease (ie, an improvement) in absenteeism and/or sick leave days post-surgery. The remaining 5 studies found no changes in absenteeism or sick leave days post-surgery; however, two of them identified short-term positive effects.[14,44] King et al[14] found that absenteeism (ie, missed work due to health) initially decreased after surgery, but rebounded by year 3 and remained stable thereafter. Norrbäck et al[44] reported that the annual work loss (the sum of days of sick leave and disability pension) decreased from 2.5 months to 1.99 months the first year postsurgery but returned to the baseline level at the fifth year.

Four of 5 comparisons reported increases in work hours[38,49,57] or incomes[44] postsurgery, with the remaining 1 reporting a slightly and insignificant increase in average paid work participation per week (31.2 hours at baseline vs 32.8 hours at year 2 postsurgery; $P = .51$).[48]

Work Capacity (Presenteeism, Work Ability Index, Work Impairment)

All 4 comparisons investigating work capacity showed positive outcomes. To illustrate, Kantarovich et al[35] reported significant improvements in employment outcomes 2 years following surgery, with 68% of participants reporting decreased employment impairment and 44% reporting increased work productivity. Additionally, Köhler et al[36] observed improved work ability index scores at the fourth-year postsurgery, indicating enhanced productivity and capacity to work. King et al[14] found that presenteeism increased from year 3 to year 7 postsurgery and then remained better than preoperative levels (eg, participants reporting any at 7 years: 43%; preoperatively: 63%).

Long-Term Work Loss (Disability Pension, State Benefits)

The result of disability pension and state benefits was mixed, with 2 improved, 3 indifferent, and 2 worse outcomes. Gormsen et al[11] (with 749 patients undergoing laparoscopic RYGB) reported the percentage of patients post-RYGB receiving a disability pension or flex benefit increased significantly from 8% preoperatively to 11% after 5 years. Van den Eynde et al[51] (with 16276 bariatric patients) found a consistent reduction of inactive population during the 5-year follow-up. Norrbäck et al[44] found a reduction of annual work loss (sum of disability and absenteeism) at the first year after surgery, which then returned to the baseline level at the fifth year.

Subgroup Analysis

Subgroup analyses by surgery type for the before vs after comparison are presented in eTable 6 in Supplement 2, with studies of RYGB or mixed procedures (mostly comprised of RYGB) driving the main results reported above. More positive outcomes were found in studies with other procedures; however, these involved smaller sample sizes and were conducted in earlier years.

Occupational Outcomes Between Surgery vs Nonsurgery Groups

Overall, 13 studies with 14 comparisons investigated outcomes in surgery vs nonsurgery groups. The results are summarized in **Table 3** and eFigure 1B in Supplement 1, with full details in eTable 7 in Supplement 2. Sample sizes were smaller in earlier studies, and half of the studies (n = 7; 53.8%) failed to match BMI between groups.

Employment Status

Among the 7 comparisons for employment rates, 4 comparisons (from 4 early studies with smaller sample sizes) concluded positive changes for surgical patients in the short term, while the remaining 3 comparisons (from 2 larger recent studies)[13,43] showed short-term effects but indifferent or worse long-term outcomes. For example, Juhl et al[13] demonstrated a significant positive but modest effect on employment status from baseline to the first year after surgery, but this was not sustained after 7 years of follow-up.

Consistent trends were observed for unemployment rates. Four of 5 comparisons indicated lower unemployment rate in the surgical group; however, these studies were subject to small sample sizes without BMI matching. The remaining study by Bramming et al[21] in Denmark (9126 bariatric patients and 10 328 patients with obesity) showed that the unemployment rate was similar between groups, especially for the men, but significantly higher in women at 5 years after surgery.

Table 2. Summary of Occupational Outcomes Before vs After Bariatric Surgery (n = 38 With 39 Comparisons)

Source	Country	Occupational outcomes[a]							Follow-up time	Sample size
		Employment rate	Unemployment rate	RTW	Absenteeism, sick leave	Presenteeism, work ability, impairment	Work hours, incomes, earnings	Disability pension, state benefits		
Crisp et al,[25] 1977	UK	+				+			2 y	47
Hawke et al,[32] 1990	Australia	+							1, 2, 3 y	310 at Baseline; 240 at 3-y follow-up
Martin et al,[38] 1991	US	+							41 (12-59) mo	100
Rabner et al,[46] 1993	US	+	+						24 (4-84) mo	33
van Gemert et al,[53] 1999	Netherlands	+	0		+				2 y	21
Narbro et al,[40] 1999	Sweden				+			-	1, 2, 3, 4 y	369 Surgically treated patients
Papageorgiou et al,[45] 2002	Greece	0	0						10-12 mo	53
Velcu et al,[54] 2005	US	0	0						1, 2, 3, 4, 5 y	41
Wolfe et al,[56] 2006	US	0	0						Survey within 3 y	93 (Completed surveys of 194 mailed)
Hawkins et al,[33] 2007	UK	+					+	+	14 (3-32) mo	59
Mathus-Vliegen et al,[39] 2007	Netherlands	0			+				1, 2.5, 5 y	49
Nickel et al,[42] 2007	Germany	+							3, 4, 5, 6 y	21 Patients
Wagner et al,[55] 2007 (unemployed cohort)	US			+					44 (14-97) mo	38 Patients with medical disability underwent RYGB
Andersen et al,[48] 2010	Norway	+	+				0		1, 2 y	51
Date et al,[26] 2013	UK	+							1 y	51 (23 With morbid obesity, 28 with super obesity)
Mariano et al,[12] 2013	Brazil	-	-						1 y	30
Turchiano et al,[50] 2014 (unemployed cohort)	US		+	+					1 y	72 Unemployed surgical patients
Andersen et al,[20] 2015	Norway	0	0		+			0	5 y	224
Durand-Moreau et al,[27] 2015	France	0	+						5 y	803
Hanvold et al,[31] 2015	Norway		0						2 y	165
Jönsson et al,[34] 2017	Sweden				0				3 y (3-mo intervals)	4971 Surgery patients
Riccò et al,[47] 2017	Italy	+							2 y	30
Tarride et al,[49] 2017	Canada	0					+	0	1 y	304 (138 Returned the questionnaire)
Zubiaurre et al,[57] 2017	Brazil				+		+		1, 2, 3, >3 y	140 Surgery group
Courtney et al,[24] 2018	UK	+	+						7-18 mo, 19-30 mo	1011 (746 With employment data before and after)
Mancini et al,[37] 2018	France	+							2 y	238
Kantarovich et al,[35] 2019	Canada					+			2 y	211
Gormsen et al,[11] 2020[b]	Denmark	0[b]	0[b]		0			-	1-5 y	749
Cohen et al,[23] 2021	France	+	+						2 y	133
Juhl et al,[13] 2021[b]	Denmark	0[b]	+						7 y	5008 Cases

(continued)

Table 2. Summary of Occupational Outcomes Before vs After Bariatric Surgery (n = 38 With 39 Comparisons) (continued)

Source	Country	Occupational outcomes[a]: Employment rate	Unemployment rate	RTW	Absenteeism, sick leave	Presenteeism, work ability, impairment	Work hours, incomes, earnings	Disability pension, state benefits	Follow-up time	Sample size
Norrbäck et al,[43] 2021 (sister-matched cohort)	Sweden	0							1, 2, 3, 4, 5 y	1400 Bariatric patients
Norrbäck et al,[43] 2021 (BMI-matched cohort)	Sweden	0[b]							1, 2, 3, 4, 5 y	2967 Bariatric patients
Bramming et al,[21] 2022	Denmark		+		0				1, 3, 5 y	9126 Bariatric patients
Claassen et al,[22] 2022 (unemployed cohort)	Germany			+					1, 2 y	782
Halvachizadeh et al,[30] 2023[a]	Switzerland	0[b]	0[b]						6 mo; 1, 2, 4, 5 y	623 (239 Employed and 384 unemployed)
King et al,[14] 2022	US	-			0[b]	+			1-5, 7 y	1491
Van den Eynde et al,[51] 2022	Belgium	+						+	1-3 y	16 276
Köhler et al,[36] 2023	Germany	0				+			6 mo; 1, 4 y	197
Norrbäck et al,[44] 2023[c]	Sweden				0[b]		+	0[b]	1, 2, 3, 4, 5 y	15 828 Patients

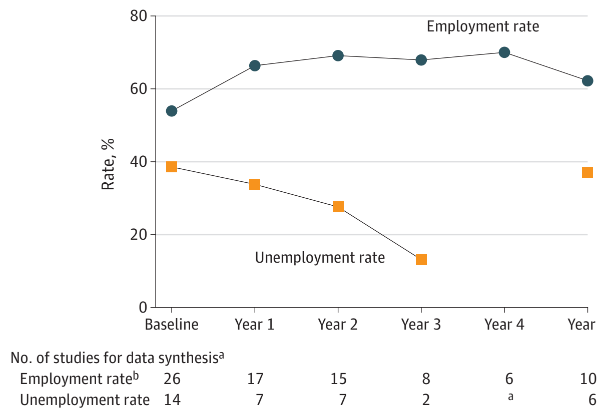
Abbreviations: O, no substantial change in outcome; +, improvement in outcome; –, worse in outcome; BMI, body mass index; RTW, return to work; RYGB: Roux-en-Y gastric bypass.

[a] Based on the longest follow-up time if multiple times applied.

[b] This occupational outcome was determined based on the longest observational time point. An improvement in occupational outcome was found in the short-term period, however, it diminished in the long-term period (U-shape trajectory).

[c] This study reported the annual work loss (the sum of days of sick leave and disability pension).

Figure 2. Employment Trajectory of Bariatric Surgery From Baseline to Postsurgery Follow-Up



[a]The employment rate at year 6 (63.2%) and year 7 (70.5%) postsurgery and the unemployment rate at year 4 (10.0%) postsurgery were not drawn because of the smaller number of included studies (n < 2).

[b]The 3 studies with unemployed cohorts (100% unemployed at the enrolment) were not considered in this analysis.

Return to Work

Higher RTW rates were observed in the surgical group in 2 unemployed cohorts. Wagner et al[55] reported a significant number of patients with morbid obesity and Medicaid coverage returning to work postsurgery (37%) compared with patients in the nonoperative control group (6%). Turchiano et al[50] revealed that up to 24% of unemployed patients with severe obesity became gainfully employed 1 year after bariatric surgery, compared with 9% who did not have surgery.

Short-Term Work Loss (Absenteeism, Sick Leave, Work Hours, and Incomes)

The surgical group exhibited more days of absenteeism or sick leave in 3 of 5 included studies. Bramming et al[21] in Denmark (with propensity scores matching for age, gender, BMI, and employment status between 9126 bariatric patients and 10 328 patients with obesity) showed that the risk of absence due to sickness was higher for both men and women postsurgery compared with matched controls. The 2 more recent studies from Sweden found consistent higher absenteeism or work loss in the bariatric groups from the presurgery to postsurgery stages than the general population without obesity. Despite the larger sample size, these 2 studies used general population controls without matching BMI between groups.[34,44] The remaining 2 studies from Sweden that matched BMI indicated no difference and improvements in sick leave days.[40,41]

Only 2 studies investigated work incomes. Näslund et al[41] reported higher average monthly income among the surgical group, while Norrbäck et al[44] found no evidence of improvement.

Work Capacity

Only 1 study investigated work functioning between groups, with improvements more pronounced in the surgical group. However, this study was published in 1990s with only 28 participants.

Table 3. Summary of Occupational Outcomes Between Surgery vs Nonsurgery Groups (n = 13 With 14 Comparisons)

Source	Country	Occupational outcomes[a]							Follow-up time	Sample size	Matched variables
		Employment rate	Unemployment rate	RTW	Absenteeism, sick leave	Presenteeism, work ability, activity	Work hours, income, earnings	Disability pension, state benefits			
Näslund et al,[41] 1991	Sweden	+			+		+		≥1 y (1-5 y)	79 Surgery patients, 54 nonsurgery (waitlist)	Including baseline BMI
Greenstein et al,[28] 1994	US	+	+			+			≥9 mo	17 Surgery patients, 11 conventional diet group	Not matched for BMI
van Gemert et al,[52] 1998	Netherlands		+						85.9 ± 48.1 mo (6-168 mo)	62 Surgery patients, 20 patients with morbid obesity	Characteristics of control group matched those of the postoperative group closely, including baseline BMI
Narbro et al,[40] 1999	Sweden				0			+	6 mo; 1, 2, 3, 4 y	369 Surgically treated patients and 371 matched controls with obesity	Matching considered 18 variables related to mortality; BMI was balanced between groups
Nickel et al,[42] 2007	Germany	+							3, 4, 5, 6 y	21 Patients, 29 controls	No essential differences were found between the 2 groups
Wagner et al,[55] 2007 (unemployed cohort)	US			+					44 mo (14 to 97) and 32 mo (15 to 62)	38 Patients with medical disability underwent RYGB, 16 controls	Not matched for BMI
Gripeteg et al,[29] 2012	Sweden							+	6 mo; 1, 2, 3, 4, 6, 8, 10, 15, 20 y	2010 Surgery group, 2037 control group	Matched control group of 2037 created using sex and 18 other variables
Turchiano et al,[50] 2014 (unemployed cohort)	US	+	+	+					1 y	72 Unemployed surgical patients, 121 unemployed patients with severe obesity	Not matched for BMI
Jönsson et al,[34] 2017	Sweden				-				3 y (3-mo intervals)	4971 Surgery patients, 49 710 reference population	Not matched for BMI (general population as reference group)
Juhl et al,[13] 2021[a]	Denmark	-[b]	+						1, 2, 3, 4, 5, 6, 7 y	5008 Cases, 10 148 controls	Not matched for BMI (general population as reference group)
Norrbäck et al,[43] 2021 (sister-matched cohort)	Sweden	-[b]							1, 2, 3, 4, 5 y	1400 Bariatric patients, 1400 patients with obesity	Not matched for BMI (general population as reference group)
Norrbäck et al,[43] 2021 (BMI-matched cohort)	Sweden	0[b]							1, 2, 3, 4, 5 y	2967 Bariatric patients, 2967 patients with obesity	Variables used for matching were BMI, birth year, education, and previous hospitalization with a cardiovascular, psychiatric, or a musculoskeletal diagnosis
Bramming et al,[21] 2022	Denmark		0		-				1, 3, 5 y	9126 Bariatric patients, 10 328 patients with obesity	Propensity scores based on all potential cofounders, including age, gender, BMI, and employment status
Norrbäck et al,[44] 2023[c]	Sweden				-[c]		0[b]	-[c]	1, 2, 3, 4, 5 y	15 828 Patients, 15 828 general population	Not matched for BMI (general population as reference group)

Abbreviations: 0, no substantial difference in outcome; +, improvement in outcome; –, worse in outcome; BMI, body mass index; RTW, return to work.

[a] Based on the longest follow-up time if multiple times applied.

[b] This occupational outcome was determined based on the longest observational time point. An improvement in occupational outcome was found in the short-term period, however, it was diminished in the long-term period (U-shape trajectory).

[c] This study reported the annual work loss (the sum of days of sick leave and disability pension).

Long-Term Work Loss (Disability Pension, State Benefits)

Three studies reported the disability pension, with 2 improved outcomes and 1 worse outcome. The significantly lower disability pension days in the surgically treated group were observed in both Narbro et al[40] and Gripeteg et al[29] studies. However, Norrbäck et al[44] (with 15 828 patients and 15 828 from the general population) reported that the annual work losses (sum of disability and absenteeism) were consistently higher in bariatric patients. Despite the larger sample size, this study used the general population as reference without matching BMI between groups.[44]

Subgroup Analysis

Subgroup analyses by surgery type for surgery vs nonsurgery groups are presented in eTable 8 in Supplement 2. Negative occupational results were mostly found in more recent studies of RYGB, while more positive outcomes were reported in studies investigating other procedures with smaller sample sizes and published in earlier years.

Reported Predictors of Occupational Outcomes After Bariatric Surgery

eFigure 2 in Supplement 1 and eTable 9 in Supplement 2 summarize the reported enablers and barriers influencing postsurgery employment outcomes. Achieving less weight loss,[21,22,30,50] being female,[13,20-22,34] being older (generally aged >50 years),[20,25,46,51] having preoperative comorbidities,[12,26,34,55] having lower quality of life,[11,23,35] and not participating in paid work before surgery[21,24,28] were predictors to poor occupational outcomes after bariatric surgery.

Discussion

This systematic review synthesized the evidence from 42 observational studies regarding the impact of bariatric surgery on employment and productivity outcomes. Over the past decade, the growing number of studies reflects increasing interest in understanding the broader socioeconomic implications of these procedures. Notably, most studies were conducted in high-income countries, with gastric bypass being the most investigated surgery type. Despite inconsistencies in reporting employment outcomes, employment and unemployment rates and absenteeism/sick leaves were the most frequently evaluated metrics. Bariatric surgery has shown positive effects on work productivity and short-term workforce participation, although evidence on long-term employment outcomes remains limited. Key barriers to postsurgical occupational outcomes included achieving insufficient weight loss, female sex, advanced age, preoperative comorbidities, lower quality of life, and preoperative unemployment.

The key finding from this review is the consistent positive impact of bariatric surgery on work productivity, particularly by improving presenteeism, work hours, and overall work capacity. Bariatric surgery is also reported to be associated with improved short-term employment participation, particularly within the first 1 to 2 years postoperatively. These early gains, often referred to as a honeymoon effect, are likely driven by rapid weight loss, alleviation of obesity-related comorbidities, and improved physical and psychological functioning,[20,34] which together enhance work ability and capacity.[36] However, sustaining these occupational benefits remains a significant challenge beyond the early postoperative phase.[58] Longitudinal data reveal that postoperative employment rates tend to peak and subsequently decline, forming a reversed U-shaped trajectory,[11,13,14,30] with many individuals returning to baseline employment levels after approximately 5 years. The underlying causes of this decline remain unclear but likely reflect the chronic, relapsing nature of obesity and the complex social, physical, and psychological barriers that patients face long term after surgery.[59] These observations emphasize that obesity is a chronic and lifelong condition requiring sustained management, rather than a 1-time intervention.[60,61] We hypothesize that long-term employment gains could be better preserved or even enhanced through ongoing postsurgical support, for example, integrating long-term pharmacological therapies (eg, GLP-1 receptor agonists) and implementing coordinated, multidisciplinary care (incorporating nutritional counselling, physical activity programs, and psychosocial support), to maintain health improvements and maximize societal and economic benefits.[14,36]

Our findings indicated that certain groups of patients, such as females, older adults, and those with preoperative comorbidities or limited work experience, are particularly vulnerable to suboptimal employment outcomes after bariatric surgery. To mitigate these risks, tailored interventions are essential. Female patients, especially women of reproductive age, for example, may benefit from maternal leave support programs that address specific career barriers.[13,21,44,51,52] Older patients might require additional rehabilitation and career counselling to reenter or remain in the workforce.[13,22,25,46] Furthermore, career training and job placement services for those who were not employed before surgery could enhance overall employment outcomes, reducing the economic burden of obesity and maximizing the societal benefits of bariatric surgery.[20,24,34,44]

Limitations of Previous Work and Recommendations for Future Research

This review highlighted several gaps in previous work, including a lack of research in low- to middle-income settings; limited evidence on the increasingly common SG procedure; a scarcity of randomized trial designs, which reduces the comparability and strength of causal inferences; inconsistent measurement of occupational outcomes; insufficient long-term follow-up; and a lack of comparative effectiveness data between bariatric surgery and novel GLP-1 receptor agonists such as semaglutide and tirzepatide. Future studies should aim to address these gaps by conducting randomized or well-controlled surgery vs control comparisons with BMI-matched cohorts, focusing on SG-specific outcomes, incorporating GLP-1 therapies as comparators, including participants from underrepresented regions, undertaking longitudinal analyses of career progression, and adopting standardized outcome measures to enhance comparability and evidence quality. A detailed list of limitations and recommendations is provided in eTable 10 in Supplement 2.

Strengths and Limitations of This Review

This study provides a comprehensive overview of the impact of bariatric surgery on occupational outcomes, synthesizing evidence across multiple studies over multiple decades. However, the review is also limited by the heterogeneity of the included studies, particularly regarding the different definitions of occupational outcomes and variations in surgery types across multiple countries.

Second, small sample sizes and short follow-up times raised concerns about data reliability. Third, the reclassification of the occupational outcomes in this study is subjective. For example, the work hours missed was classified as "short-term work loss"; however, it is not clear if some of these hours were attributed to longer-term disability or early retirement.

Despite these limitations, rigorous inclusion criteria, exhaustive literature searches, and validated data synthesis methods enhance the robustness of this review. This project highlights the critical need for long-term strategies to maintain and amplify the occupational benefits postsurgery and to develop targeted interventions for at-risk populations.

Conclusions

Bariatric surgery may offer broad economic and social benefits above and beyond its immediate health benefits. This review demonstrates the short-term impact of bariatric surgery on workforce productivity and participation, while the long-term sustainability of these outcomes remains uncertain. Certain subgroups, such as females and older adults, may require additional postsurgery employment support. This study highlights the need for continued research into effective postsurgical support strategies and the social value of long-term investment.

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Author Affiliations: Australian Centre for Health Services Innovation and Centre for Healthcare Transformation, School of Public Health and Social Work, Faculty of Health, Queensland University of Technology, Brisbane, Queensland, Australia (Xia, Donovan, Carter); School of Mathematics and Statistics, University of Melbourne, Parkville, Victoria, Australia (Diao); Shanghai Yangpu District Center for Disease Control and Prevention, Shanghai, China (Yang); Centre for Big Data Research in Health, University of New South Wales, New South Wales, Australia (Jin); Precision Statistics Pty Ltd, Artarmon, New South Wales, Australia (Jin); Department of Public Health Sciences, College of Behavioural, Social, and Health Sciences, Clemson University, Clemson, South Carolina (Lartey).

Author Contributions: Dr Xia had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
Concept and design: Xia, Lartey, Carter.
Acquisition, analysis, or interpretation of data: Xia, Donovan, Diao, Yang, Jin, Lartey.
Drafting of the manuscript: Xia.
Critical review of the manuscript for important intellectual content: All authors.
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