Bariatric Surgery: The Impact of Socioeconomic Factors and Indigenous Status

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Background

- Prevalence of obesity much higher in Indigenous populations at 37.8% vs 22.6% for non-Indigenous
- Rate of diabetes is two times higher and manifests at lower age and lower body mass index (BMI)
- Bariatric surgery is the only proven modality to treat severe obesity (BMI ≥ 35)
- Bariatric surgery rarely performed on Indigenous people with Bariatric Outcomes Longitudinal Database (BOLD) study finding only 0.46% of bariatric surgery done on Indigenous people in the US.

Objectives

- To determine socioeconomic factors that influence access to bariatric treatment and surgery for Indigenous Canadians

Methods

- Retrospective review of all patients of the Edmonton Adult Bariatric Specialty Clinic who were discharged from clinic care in 2016
- Clinical data included BMI, comorbidities, surgical details, and complications
- Socioeconomic data included age, sex, education, marital status, occupation, alcohol use, smoking, Indigenous status, and estimated incomes
- The Data Integration, Measurement & Reporting (DIMR) database was used to acquire Indigenous statuses and estimated incomes
- Incomes were estimated from postal codes and Statistics Canada data

Results

Table 1. Patient demographics, mean ± sd or n (%)

	Study population	Completed program	Non-completion
	n = 781	n = 235	n = 546
Mean age (years)	44.8 ± 11.4	44.7 ± 10.1	44.9 ± 11.9
Female	569 (72.9)	193 (82.1)	376 (68.9)
Initial BMI (kg/m²)	47.8 ± 8.7	48.2 ± 9.6	48.4 ± 9.3
Comorbidities			
Diabetes	240 (30.8)	72 (30.6)	168 (30.8)
Hypertension	360 (46.1)	111 (47.2)	249 (45.7)
Dyslipidemia	206 (26.4)	73 (31.1)	133 (24.5)
Coronary artery disease	46 (5.9)	12 (5.1)	34 (6.2)
Osteoarthritis	252 (32.3)	63 (26.8)	189 (34.7)
Obstructive sleep apnea	367 (47.1)	114 (48.5)	253 (46.4)
Asthma	123 (15.8)	27 (11.5)	96 (17.6)
Anxiety	154 (19.7)	42 (17.9)	112 (20.6)
Depression	352 (45.1)	104 (44.3)	248 (45.5)
Hypothyroidism	146 (18.9)	54 (23.0)	92 (16.9)
Non-alcoholic fatty liver disease	100 (12.8)	12 (5.1)	88 (16.2)

Table 2. Demographics of Indigenous cohort, mean ± sd, median (IQR) or n (%)

	n = 7
Mean age (years)	47.0 ± 5.3
Female	5 (71.4)
BMI (kg/m²)	58.8 ± 11.7
Driving distance from bariatric clinic (km)	6.8 (2.8 – 247.6)
Education	Secondary (57.1%)
Marital status	Single (71.4%)
Occupation	Unemployed (100%)
Estimated Income (CAD)	55739 ± 23853

Table 3. Socioeconomic factors, mean ± sd or median (IQR) or n (%)

	Study population	Completed program	Non-completion
Distance to bariatric centre (km)	17.7 (10.7 – 72.3)	21.4 (12.7 – 213.7)	16.0 (9.8 – 46.6)
Estimated income (CAD)	66231 ± 25769	69599 ± 25041	64838 ± 25849
Indigenous status	7 (0.94)	0 (0)	7 (1.3)
Smoker	105 (13.6)	13 (5.6)	92 (17.0)
Alcohol abuse	10 (1.3)	0 (0)	10 (1.86)

Table 4. Education, n (%)

	Study population	Completed program	Non-completion
Primary	17 (2.2)	3 (1.3)	14 (2.6)
Secondary	264 (34.7)	72 (31.4)	192 (36.1)
College	307 (40.3)	96 (41.9)	211 (39.7)
University	173 (22.7)	58 (25.3)	115 (21.6)

Table 5. Marital status, n (%)

	Study population	Completed program	Non-completion
Single	186 (24.1)	38 (16.5)	148 (27.4)
Widowed	12 (1.6)	4 (1.7)	8 (1.5)
Separated	89 (11.5)	23 (10)	66 (12.2)
Common-law	86 (11.2)	19 (8.3)	67 (12.4)
Married	398 (51.6)	146 (63.5)	252 (46.6)

Table 6. Occupation, n (%)

	Study population	Completed program	Non-completion
Unemployed	155 (20.3)	38 (16.6)	117 (22.0)
Student	9 (1.2)	3 (1.3)	6 (1.1)
Labour	38 (5.0)	9 (3.9)	29 (5.4)
Intermediate	173 (22.7)	50 (21.8)	123 (23.1)
Skilled trades	205 (26.9)	74 (32.3)	131 (24.6)
Management	108 (14.1)	40 (17.5)	68 (12.8)
Professional	74 (9.7)	15 (6.6)	59 (11.1)

Table 7. Factors predictive of completion of bariatric surgery

Socioeconomic Factor	Odds Ratio (95% CI)	p > z
Married	2.04 (1.2 – 3.5)	0.008
Non-smoker	0.30 (0.14 – 0.65)	0.002
Female	0.33 (0.19 – 0.56)	< 0.001

Discussion

- 781 patients in study with 235 completing the bariatric surgery program.
- Only seven Indigenous patients seen in clinic with none completing bariatric surgery program.
- Factors predictive of completion of bariatric program were being married, females and non-smokers.
- Other socioeconomic factors such as education, income, and occupation were not predictive.
- Inequities to necessary health care are unacceptable and contribute to gaps in health status between Indigenous and non-Indigenous people.
- Improving access to bariatric care for Indigenous populations include improving patient-provider communication by understanding sociocultural and pollical contexts.
- This includes understanding Indigenous customs, language, the historical reasons for mistrust, the importance of Indigenous family structures and allowing for Indigenous medicine in treatment.
- Limitations to this study include: retrospective nature, potentially overinflated education and occupations due to self-reporting, inaccuracy of income estimations, and only capturing patients seen in clinic.

Conclusions

- Despite an alarming rate of obesity in Indigenous populations, few are treated in specialized bariatric treatment centres or with bariatric surgery.
- More effort should be aimed at removing barriers to bariatric care and improving treatment to underserved populations.