Prioritization and willingness to pay for bariatric surgery: the patient perspective

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Background: Access to publicly funded bariatric surgery is limited, potential candidates face lengthy waits, and no universally accepted prioritization criteria exist. We examined patients' perspectives regarding prioritization for surgery.

Methods: We surveyed consecutively recruited patients awaiting bariatric surgery about 9 hypothetical scenarios describing patients waiting for surgery. Respondents were asked to rank the priority of these hypothetical patients on the wait list relative to their own. Scenarios examined variations in age, clinical severity, functional impairment, social dependence and socioeconomic status. Willingness to pay for faster access was assessed using a 5-point ordinal scale and analyzed using multivariable logistic regression.

Results: The 99 respondents had mean age of 44.7 ± 9.9 years, 76% were women, and the mean body mass index was 47.3 ± SD 7.6. The mean wait for surgery was 34.4 ± 9.4 months. Respondents assigned similar priority to hypothetical patients with characteristics identical to theirs (p = 0.22) and higher priority (greater urgency) to those exhibiting greater clinical severity (p < 0.001) and functional impairment (p = 0.003). Lower priority was assigned to patients at the extremes of age (p = 0.006), on social assistance (p < 0.001) and of high socioeconomic status (p < 0.001). Most (85%) respondents disagreed with payment to expedite access, although participants earning more than $80 000/year were less likely to disagree.

Conclusion: Most patients waiting for bariatric surgery consider greater clinical severity and functional impairments related to obesity to be important prioritization indicators and disagreed with paying for faster access. These findings may help inform future efforts to develop acceptable prioritization strategies for publicly funded bariatric surgery.

Contexte : Les régimes publics donnent un accès limité à la chirurgie bariatrique; les candidats potentiels font face à des attentes prolongées et il n'existe pas de critères de priorisation universellement acceptés. Nous avons analysé le point de vue des patients relativement à la priorisation des candidats à la chirurgie.

Méthodes : Nous avons recruté consécutivement des patients en attente de chirurgie bariatrique et nous les avons interrogés au sujet de 9 scénarios hypothétiques décrivant des patients en attente de chirurgie. Nous avons demandé aux répondants de classer ces patients hypothétiques par ordre de priorité sur la liste d'attente par rapport à la priorité de leur propre cas. Les scénarios présentaient des variations d'âge, de gravité de l'état clinique, d'atteintes fonctionnelles, de dépendance sociale et de statut socioéconomique. Nous avons déterminé au moyen d'une échelle ordinale en 5 points si les patients étaient disposés à payer pour accéder plus rapidement au traitement et nous avons analysé les réponses par régression logistique multivariée.

Résultats : Les 99 répondants avaient en moyenne 44,7 ± 9,9 ans, 76 % étaient des femmes dont l'indice de masse corporelle moyen était de 47,3 ± 7,6. Le temps d'attente moyen pour la chirurgie était de 34,4 ± 9,4 mois. Les répondants ont assigné une priorité similaire aux patients hypothétiques dont les caractéristiques étaient identiques aux leurs (p = 0,22) et une priorité plus élevée (urgence supérieure) à ceux qui présentaient un état clinique plus grave (p < 0,001) et une détérioration fonctionnelle plus prononcée (p = 0,003). Une priorité moins grande a été assignée aux patients qui se trouvaient aux 2 extrémités de l'éventail des âges (p = 0,006), aux bénéficiaires de l'aide sociale (p < 0,001) et aux personnes de statut socioéconomique élevé (p < 0,001). La plupart des répondants (85 %) se sont exprimés contre le paiement pour accélérer l'accès, même si les participants qui gagnaient plus de 80 000 $ par année étaient moins enclins à s'y opposer.

Conclusion : La plupart des patients en attente d'une chirurgie bariatrique considèrent que la gravité de l'état clinique et les atteintes fonctionnelles associées à l'obésité sont d'importants indicateurs de priorisation et s'opposent à payer pour un accès plus rapide à l'intervention. Ces observations pourraient guider une éventuelle mise au point de stratégies de priorisation pour la chirurgie bariatrique financée par les régimes publics.

Extreme obesity (body mass index [BMI] ≥ 35) in Canada has increased in prevalence by 400% over 2 decades and is rising at a disproportionately faster rate than lesser degrees of obesity.[1,2] Clinical practice guidelines recommend that bariatric surgery be considered for extremely obese patients refractory to nonsurgical therapy.[3] Patients who have a BMI of 35–39.9 and a major obesity-related comorbidity or a BMI of 40 or higher are considered eligible for surgery.[3] Surgery reduces weight by approximately 35% and 15-year mortality by 30%, substantially decreases obesity-related comorbidity,[3–5] improves quality of life, and is cost-effective.[6,7]

On the basis of these data, use of bariatric surgery has risen dramatically. Between 1998 and 2008, the annual number of procedures performed worldwide increased 8-fold.[8] In Canada, the number of publicly funded bariatric surgeries performed annually has increased 12-fold to 1882 procedures over 2 decades.[9,10] Despite this trend, demand for surgery greatly exceeds supply.[11] An estimated 1.5 million adults in Canada meet guideline-concordant eligibility criteria for surgery; however, less than 1% of these patients access surgery annually within the publically funded health care system, and wait times average 5 years.[11,12]

Even if future surgical capacity is dramatically increased, only a very small proportion of eligible candidates will be able to access surgery, and a dilemma exists in terms of how to optimally allocate this scarce resource.[11,13] Currently, no universally accepted prioritization criteria exist. In Canada, eligible candidates are placed in the queue on a first come, first served basis. Critics of this method of allocation contend that it ignores other relevant prioritization indicators, including greatest need or capacity for benefit, and that it is subject to manipulation if patients are placed on multiple wait lists.[14] With limited evidence to guide selection, ensuring transparency and consistency in the triage process is important, and the viewpoints of all key stakeholders require consideration. The objective of this study was to examine the perspectives of patients approved for and awaiting surgery to identify the factors they feel to be key prioritization indicators for bariatric surgery.

Methods

Participants and setting

We invited all consecutive adult (age ≥ 18 yr) patients in the Adult Specialty Clinic of the Edmonton Weight Wise regional obesity program who were approved for and awaiting bariatric surgery between Nov. 1, 2010, and Mar. 30, 2011, to participate in this study. This clinic delivers medical and surgical obesity treatment to patients with a BMI of 35 or higher (approximately 125 000 adult patients within a catchment area of about 1.5 million).[15] Annually, approximately 800 new referrals are processed and 200–250 bariatric surgeries are performed. During the study period, 1050 patients were added to the wait list.

New referrals are placed in the queue from the date of initial processing, and patients enter the clinic on a first come, first served basis. All patients undergo multidisciplinary obesity evaluation and receive medical management (e.g., intensive lifestyle modification, mental health assessment, screening for obstructive sleep apnea and eating disorders, physiotherapy and social worker assessment if needed), which may take 3–12 months. Patients interested in surgery then undergo multidisciplinary assessment to determine suitability and, if approved, receive surgery within 4–6 weeks. Overall, the total time period from the point of referral to surgery is 2–3 years.

Study sample

The University of Alberta Research Ethics Board approved the study, and written informed consent was obtained from each participant. Patients were approached while attending a preoperative bariatric surgery education session (2–4 weeks before surgery). Those who consented completed a survey, which was administered online using SurveyMonkey.

Survey instrument

A previously published survey used to examine patients' views regarding prioritization for coronary artery bypass grafting in the Canadian public health care system was modified and adapted for use (see the Appendix, available at cma.ca/cjs).[16] Participants were presented a series of 9 hypothetical scenarios. In each, respondents were asked to rank where they would place the patient depicted in the scenario in the queue for bariatric surgery relative to themselves.[16] For example, in scenario A, respondents were asked, "Patient A is at home and is waiting to have the same obesity surgery procedure as you. Patient A has waited the same length of time, and has the exact same symptoms as you. Patient A is also the same age as you and has the same medical problems. Please rank where you think Patient A should be on the waiting list compared to

you." Respondents were asked to choose one of the following options: 0 = very far behind you, 1 = a little bit behind you, 2 = your place, 3 = a little bit ahead of you, 4 = very far ahead of you. The subsequent 8 scenarios examined variations in the age, clinical acuity, functional impairment, social dependence and socioeconomic status of the hypothetical patient. Two final questions examined willingness to pay for expedited surgery by assessing 1) if the participant agreed that this option should be available for those who can pay and 2) if the participant would be prepared to pay to expedite his or her own surgery. Responses were scored along a 5-point ordinal scale ranging from 1 = strongly disagree to 5 = strongly agree.

Statistical analysis

We assigned an integer value ranging from –2 (very far behind you) to +2 (very far ahead of you) to each response about the 9 hypothetical scenarios. A response of "your place" was assigned a score of 0, indicating an equivalent place in the queue as the respondent. We then used Wilcoxon signed rank tests to compare the mean score to a score of 0. A Bonferroni adjustment was applied to the conventional p value of 0.05; thus, we considered results to be significant at $p < 0.006$ (i.e., 0.05 divided by 9).

We undertook several exploratory analyses. First, we performed a sensitivity analysis stratified by the age of the hypothetical patient (20 yr v. 60 yr) to examine the relative effect of increasing social and physical dependency on prioritization. In this analysis, pairwise comparisons between scenarios B1–B3 and scenarios C1–C3 were performed. Second, we performed subgroup analyses to examine variations in scenario responses by survey respondent age, sex, BMI, education level and annual income. Third, the we grouped the "strongly disagree" and "disagree" responses and the "neutral," "agree" and "strongly agree' responses to create a dichotomous outcome variable, and 2 multiple logistic regression models were constructed to identify significant ($p < 0.05$) predictors of disagreeing with out-of-pocket payments for surgery. One model assessed the probability of disagreeing with faster access for others, and the second model examined the probability of disagreeing with expedited access for oneself. Age, sex, BMI, education level, socioeconomic tertile and time in the queue from initial referral to survey completion were predictors of interest and were forced into each model. All analyses were conducted using SAS version 9.1.

Results

Survey respondent characteristics

Of the 105 patients invited to participate, 99 consented and completed the survey, for a response rate of 94%. The mean age of respondents was 44.7 ± 9.9 years, the mean BMI was 47.3 ± 7.6, and most (76%) respondentes were women (Table 1). Nearly half (46%) had completed postsecondary education and 38% had an income of $80 000 or more. The average wait from initial referral to survey completion averaged 34.4 ± 9.4 months, and the time spent in the Adult Weight Management Clinic averaged 14.2 ± 7.2 months.

Survey scenario results

The hypothetical patients from the survey are described in Table 2, and participant responses are summarized in Table 3 and Figure 1. Respondents assigned a similar mean priority score to hypothetical patients with characteristics identical to their own (mean score relative to the respondent's own position –0.04, Wilcoxon signed-rank statistic [WSR] –7.0, $p = 0.22$). Conversely, higher mean scores were assigned to hypothetical patients exhibiting

Table 1. Baseline characteristics of survey respondents, $n = 99$

Characteristic	No. (%)*
Age, mean ± SD, yr	44.7 ± 9.9
Sex, female	75 (76)
Weight, mean ± SD, kg	134.6 ± 26.3
BMI mean ± SD	47.3 ± 7.6
Education	
Completed postsecondary	46 (47)
Did not complete postsecondary	53 (53)
Income level†	
< $50 000	29 (29)
$50 000–$79 999	22 (22)
≥ $80 000	38 (38)
Time from initial assessment in the adult specialty clinic to approval for surgery, mean ± SD, mo‡	14.2 ± 7.2
Time from initial referral to Weight Wise to approval for surgery, mean ± SD, mo§	34.4 ± 9.4

BMI = body mass index; SD = standard deviation.
*Unless otherwise indicated.
†$n = 89$ owing to missing responses.
‡$n = 94$ owing to missing responses.
§$n = 93$ owing to missing responses.

Table 2. Hypothetical patient scenarios included in survey

Scenario	Description
A1	Exactly the same as respondent
A2	Recently admitted to hospital with acute illness related to obesity
B1	60 years old
B2	60 years old, uses wheelchair, receives home care support
B3	60 years old, unable to get out of bed, living in nursing home
C1	20 years old
C2	20 years old, married with 4 children, sole income earner for family
C3	20 years old, unmarried, receives social assistance
D	Donated $5 million to the hospital foundation

greater clinical severity, as manifested by a recent obesity-related hospital admission (mean score 0.70, WSR 1269, $p < 0.001$), being wheelchair bound and receiving home care (mean score 0.24; WSR 297, $p = 0.003$) and being bed-ridden in a nursing home (mean score 0.30, WSR 297, $p = 0.003$). Conversely, lower mean scores were assigned to the hypothetical patient who was 20 years old (mean score –0.24, WSR –175, $p < 0.001$), to the one who was 60 years old (mean score –0.18, WSR –125, $p = 0.006$), to the younger patient with no dependents who was receiving social assistance (mean score –0.22, WSR –110, $p < 0.001$) and to the wealthy hospital donor (mean score –0.37, WSR –163, $p < 0.001$).

Survey scenario subgroup analyses

Within the 3 scenarios involving a 60-year-old patient, respondents prioritized moderate (wheelchair bound/receiving home care) and severe (bed-ridden in a nursing home) functional dependence over functional independence (Table 4; both $p < 0.001$). The direct comparison between moderate and severe functional dependence indicated that both were felt to be of equal priority ($p = 0.37$). Within the 3 scenarios involving 20-year-old patients, respondents prioritized the young sole-income earner with 4 dependents over the unmarried 20-year-old receiving social assistance and the 20-year-old with no other history (both $p < 0.001$; Table 4). No major differences in prioritization scores were identified when subgroup analyses were performed according to age, sex, education and income (Appendix, Tables S1 and S2).

Willingness to pay

In all, 85% of the respondents disagreed with the idea of allowing patients to hasten surgical access through out-of-pocket payments, and 6% of respondents were uncertain (Table 5). However, fewer respondents (64%) disagreed with paying to expedite access for themselves, and 27% were uncertain.

Results of the multivariable logistic regression models predicting the probability of disagreeing with payment to expedite access to surgery are shown in Table 6. The time spent in the queue was not a significant predictor in either model. Compared with participants earning less than $50 000 per year, Those earning $50 000–$79 999 (adjusted odds ratio [OR] 0.11, 95% confidence interval [CI] 0.03–0.46) and those earning $80 000 or more (adjusted OR 0.16, 95% CI 0.04–0.65) were less likely to disagree with paying for faster access for themselves.

Discussion

Respondents indicated that patients waiting for bariatric surgery should be prioritized based on clinical severity and functional impairment rather than on the traditional first come, first served approach. Respondents ranked hypothetical patients at the extremes of age and socioeconomic status further behind in the bariatric surgery queue than those of middle age and middle income. Finally, most respondents were against allowing out-of-pocket payments to expedite surgery for others or themselves, although fewer participants disagreed with paying for faster access for themselves — especially those earning higher incomes. To our knowledge, this is the first published study to examine patients' views regarding prioritization and willingness to pay for bariatric surgery.

The large gap between supply and demand for publicly funded bariatric surgery has resulted in protracted wait times for this procedure in Canada and in similarly structured health care systems throughout the world.[11,13,17] Wait times for bariatric surgery in Canada, which average 5 years, are the longest for any type of surgical treatment in this country.[12] No universally accepted and validated systems to prioritize patients for surgery currently exist, although we and others are developing more rigorous methods that account for more than just weight.[18]

At least 4 basic ethical principles are considered important when designing allocation systems for scarce medical resources.[14] These principles include treating people equally, favouring those with more severe illness, maximizing total benefits (utilitarianism) and rewarding social usefulness.[14,19] Of these, we consider the first 3 to be the most relevant when designing a prioritization system for publicly funded bariatric surgery. None of these principles is currently being used to guide allocation decisions for bariatric surgery in Canada. Instead, allocation is on a first come, first served basis — a method considered to be inherently flawed because it favours those who can more easily access medical services.[14] Such an allocation system also fails to incorporate underlying disease severity, future prognosis or capacity to benefit into the prioritization process.[20] These factors were positively valued by the respondents of our survey (all Canadian taxpayers), are commonly included prioritization systems for other medical resources (e.g., transplants, cardiac interventions) and should be considered in future efforts to define prioritization strategies for bariatric surgery.

Respondents disagreed with a pay-for-access system of allocation, and this finding is consistent with those of other studies involving Canadians awaiting coronary procedures and cataract surgery.[16,21] Respondents negatively viewed higher socioeconomic status, placing the hypothetical hospital donor behind them in the bariatric surgery queue. That stated, respondents who earned higher incomes were also more likely to consider paying for faster access themselves. The role — if any — that a parallel private system should play in reducing wait times within the public system remains undefined and understudied but needs to be explored and understood in greater depth. Clearly, much

work needs to be done before valid and reliable prioritization strategies are available. The views of other key stakeholders, including health care providers, administrators, funders and the general public, should also be examined and then incorporated into a more evidence-based and stakeholder-informed process for the allocation of the very scarce resource that is bariatric surgery.

Limitations

This study was performed in a sample of patients approved for and awaiting bariatric surgery (i.e., who were near the front of the queue) in a population-based program in Canada; in the absence of confirmatory studies, the results should be generalized with caution to other

Table 3. Survey scenario mean scores

Scenario*	Mean difference ± SD relative to respondent's own position†	Wilcoxon signed-rank statistic	*p* value‡
A1: Exactly the same as respondent	–0.04 ± 0.25	–7.0	0.22
A2: Recently admitted to hospital with acute illness related to obesity	0.70 ± 0.85	1269.5	< 0.001
B1: 60 years old	–0.18 ± 0.66	–124.5	0.006
B2: 60 years old, uses wheelchair, receives home care support	0.24 ± 0.80	297.0	0.003
B3: 60 years old, unable to get out of bed, living in nursing home	0.30 ± 0.96	435.0	0.003
C1: 20 years old	–0.24 ± 0.55	–174.5	< 0.001
C2: 20 years old, married with 4 children and only income earner for family	0.12 ± 0.70	92.0	0.07
C3: 20 years old, unmarried, receives social assistance	–0.22 ± 0.58	–109.5	< 0.001
D: Donated $5 million dollars to the hospital foundation	–0.37 ± 0.68	–162.5	< 0.001

SD = standard deviation.
*Answer scale: 0 = very far behind you; 1 = a little bit behind you; 2 = your place; 3 = a little bit ahead of you; 4 = very far ahead of you.
†Ranges from –2 to 2; a mean score of 0 indicates that the person in the scenario was ranked at a position identical to that of the respondent; a score above 0 indicates that the person was ranked ahead of the respondent and a score below 0, behind the respondent.
‡Tests whether mean is significantly different from 0. The *p* value for statistical significance set at ≤ 0.006 to correct for multiple comparisons.

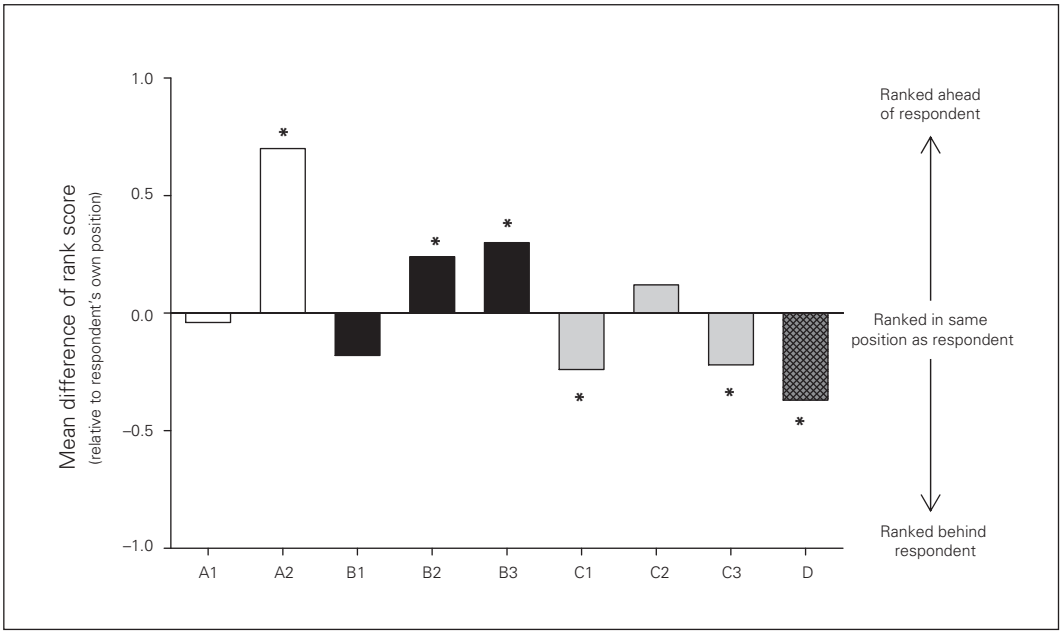

Fig. 1. Survey responses for Scenarios A–D comparing the mean hypothetical patient ranking to the respondent's own position on the wait list for bariatric surgery (*$p < 0.006$ v. respondents own place in the queue). A1 = exactly the same as respondent; A2 = recently admitted to hospital with acute illness related to obesity; B1 = 60 years old; B2 = 60 years old, uses wheelchair, receives home care support; B3 = 60 years old, unable to get out of bed, living in nursing home; C1 = 20 years old; C2 = 20 years old, married with 4 children, sole income earner for family; C3 = 20 years old, unmarried, receives social assistance; D = donated 5 million dollars to the hospital foundation.

patients on the wait list. As it is possible that the survey results may vary according to the position of participants within the queue, it would be important to examine the opinions of patients who are at an earlier stage in the referral process, particularly to determine if opinions and values evolve over time. In addition, we used structured scenarios to solicit the opinions of study participants, and the knowledge gained from this study is inherently limited to the content and context of the questions asked. Future studies using qualitative methods, such as focus groups

Table 4. Subgroup analysis of survey scenario scores within age strata to examine the effect of variations in social and/or physical dependency

Scenario*	Relative rank score ± SD	Wilcoxon signed-rank statistic	*p* value†
B2 v. B1	0.42 ± 0.76	441	< 0.001
B3 v. B1	0.48 ± 0.90	547.5	< 0.001
B3 v. B2	0.06 ± 0.79	60	0.37
C2 v. C1	0.35 ± 0.74	142.5	< 0.001
C3 v. C1	0.01 ± 0.47	4.5	> 0.99
C3 v. C2	–0.34 ± 0.73	–147.5	< 0.001

B1 = a 60-year-old patient who is otherwise identical to the respondent; B2 = a 60-year-old patient who has waited the same length of time in the queue with same symptoms as that of the respondent, but uses a wheelchair to move around and receives home care support; B3 = A 60-year-old patient who has waited the same length of time in the queue with same symptoms as that of the respondent, but is unable to get out of bed and lives in a nursing home; C1 = a 20-year-old patient who is otherwise identical to the respondent; C2 = a 20-year-old patient who has waited the same length of time in the queue with the same symptoms as that of the respondent, but is married with 4 children and is the sole income earner for the family; C3 = A 20-year-old patient who has waited the same length of time in the queue with the same symptoms as that of the respondent, but is not married and receives social assistance; SD = standard deviation.
*Answer scale: 0 = very far behind you; 1 = a little bit behind you; 2 = your place; 3 = a little bit ahead of you; 4 = very far ahead of you.
†Tests whether mean is significantly different from 0.

Table 5. Participants' responses regarding the possibility of paying and their willingness to pay for expedited surgery

	Response; no. (%)				
Question	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
Patients who can afford to pay for obesity surgery should receive their obesity surgery faster than those who cannot afford to pay	54 (54.55)	30 (30.30)	6 (6.06)	7 (7.07)	2 (2.02)
Would you be willing to pay extra to avoid having to wait for your obesity surgery?	33 (33.33)	30 (30.30)	27 (27.27)	6 (6.06)	3 (3.03)

Table 6. Results of multivariable logistic regression models examining willingness to pay

Question	Predictors (reference category)	Coefficients (SE)	OR (95%CI)
Disagreed or strongly disagreed that payment for faster access should be allowed*	Age, yr	0.009 (0.03)	1.01 (0.94–1.08)
	Sex, male (female)	–0.24 (0.72)	0.79 (0.19–3.25)
	Income		
	$50 000–$79 999/yr (< $50 000/yr)	–0.51 (0.90)	0.60 (0.10–3.53)
	≥ $80 000/yr (< $50 000/yr)	–1.32 (0.80)	0.27 (0.06–1.30)
	Postsecondary education (< postsecondary)	0.13 (0.67)	1.14 (0.31–4.19)
	BMI	–0.06 (0.04)	0.95 (0.87–1.03)
	Years in queue in WW program	–0.32 (0.39)	0.73 (0.34–1.55)
Disagreed or strongly disagreed with paying for faster access for themselves†	Age, yr	0.004 (0.03)	1.00 (0.95–1.06)
	Sex, male (female)	–0.60 (0.60)	0.55 (0.17–1.80)
	Income		
	$50 000–$79 999/yr (< $50 000/yr)	–2.21 (0.73)	0.11 (0.03– 0.46)
	≥ $80 000/yr (< $50 000/yr)	–1.81 (0.70)	0.16 (0.04–0.65)
	Postsecondary education (< postsecondary)	–0.00004 (0.55)	1.00 (0.34–2.93)
	BMI	0.005 (0.04)	1.01 (0.94–1.08)
	Years in queue in WW program	–0.46 (0.35)	0.63 (0.32–1.27)

BMI = body mass index; CI = confidence interval; OR = odds ratio; SE = standard error; WW = Weight Wise.
*Model c-statistic = 0.706.
†Model c-statistic = 0.717.

and semistructured, in-depth interviews, may provide important insights and complement our data.

Conclusion

This study improves current understanding of how patients view prioritization for bariatric surgery. Ultimately our findings and future work should help develop a better allocation system for bariatric surgery — one that is more equitable and transparent and acceptable to patients. Until then, it needs to be acknowledged that the most important stakeholders — patients awaiting bariatric surgery — are not well represented in current prioritization strategies and that their values and beliefs are not necessarily what the health care system assumes them to be.

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