

# Factors influencing primary care provider referral for bariatric surgery

## Systematic review

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### Abstract

**Objective** To identify barriers to and facilitators of primary care provider (PCP) referral for bariatric surgery in patients with obesity.

**Data sources** MEDLINE, EMBASE, and PsycINFO databases were searched and reference lists of included articles were screened to identify additional relevant articles. Two reviewers independently reviewed citations and full-text articles, and appraised the quality of the included articles using the Critical Appraisal Skills Programme Tool Qualitative Checklist and the Appraisal Tool for Cross-Sectional Studies. They extracted data on the study characteristics and the barriers to and facilitators of PCP referral for bariatric surgery. Appraisal discrepancies were resolved through consensus among authors.

**Study selection** Overall, 882 citations were identified and 18 articles were then selected for this review.

**Synthesis** Barriers included fear of surgery complications and side effects, cost, lack of availability, perception that surgery is a quick fix or a last resort, and prior negative experiences. Facilitators included direct requests from patients, patient motivation, previously failed weight-loss interventions, and obesity-related comorbidities. Those PCPs who were knowledgeable about the risks and benefits of bariatric surgery were more likely to refer their patients.

**Conclusion** Education and continuing professional development programs regarding bariatric surgery are needed to improve PCP knowledge and capacity to manage patients with obesity. Also, educating the general public on obesity, weight management, and available treatment options can empower patients and families to manage their weight and pursue evidence-informed treatments.

### Editor's key points

- ▶ Barriers to a primary care physician's decision to refer a patient with obesity for bariatric surgery include limited knowledge and education, concerns about operative morbidity and mortality, concerns about follow-up care and long-term success of surgery, presumed prohibitive cost of the procedure, prior negative experiences by patients who had surgery, and limited knowledge about current referral and practice guidelines.
- ▶ Facilitators include insurance coverage, presence of high body mass index and obesity-related comorbidities, highly motivated patients who request a referral, prior failure of non-operative strategies, and general belief in the safety and effectiveness of bariatric surgery.
- ▶ Education at the undergraduate and graduate levels and continuing professional development programs about bariatric surgery could help physicians feel more confident and comfortable in managing patients with obesity and could help limit barriers to referral.
- ▶ Public education on obesity and weight loss is needed to destigmatize obesity and to treat it as a chronic disease.

## Points de repère du rédacteur

► Parmi les obstacles qui vont à l'encontre d'une décision par un médecin de soins primaires de demander une consultation en chirurgie bariatrique pour un patient souffrant d'obésité figurent un manque de connaissances et de formation, des préoccupations concernant la morbidité et la mortalité liées à l'opération, des inquiétudes entourant les soins de suivi et la réussite à long terme de l'intervention, les coûts prohibitifs présumés de la procédure, des expériences défavorables antérieures par des patients qui ont subi l'opération, et le manque de connaissances à propos des lignes directrices actuelles sur la pratique et la demande de consultation.

► Au nombre des éléments qui facilitent les demandes de consultation, on peut mentionner la couverture par les assurances, la présence de comorbidités liées à un indice de masse corporelle élevé et à l'obésité, la forte motivation de patients qui demandent une consultation, l'échec antérieur des stratégies sans intervention chirurgicale, et la confiance générale en la sécurité et l'efficacité de la chirurgie bariatrique.

► Une formation sur la chirurgie bariatrique aux niveaux prédoctoral et postdoctoral et dans les programmes de développement professionnel continu pourrait aider les médecins à se sentir plus à l'aise et confiants lorsqu'il s'agit de prendre en charge de patients atteints d'obésité, et contribuer à atténuer les obstacles aux demandes de consultation.

► Il est nécessaire d'informer le public sur l'obésité et la perte pondérale pour déstigmatiser l'obésité et la traiter comme une maladie chronique.

# Facteurs qui influent sur les demandes de consultation en chirurgie bariatrique par les professionnels des soins primaires

## Revue systématique

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### Résumé

**Objectif** Cerner les obstacles et les facilitateurs dans la décision des professionnels des soins primaires (PSP) de demander une consultation en chirurgie bariatrique pour les personnes souffrant d'obésité.

**Sources d'information** Une recension a été effectuée dans les bases de données de MEDLINE, EMBASE et PsycINFO, et les listes de références des articles inclus ont été dépouillées pour trouver d'autres articles pertinents. Deux réviseurs indépendants ont passé en revue les citations et le texte intégral des articles, et ont évalué la qualité des articles choisis à l'aide de la liste de vérification qualitative de l'outil du Critical Appraisal Skills Programme et de l'outil d'évaluation des études transversales. Ils ont extrait les données sur les caractéristiques des études, de même que sur les obstacles et les facilitateurs dans la décision des PSP de demander une consultation en chirurgie bariatrique. Les divergences dans les évaluations ont été réglées par consensus entre les auteurs.

**Sélection des études** Dans l'ensemble, 882 citations ont été cernées, et 18 articles ont ensuite été choisis aux fins de la présente revue.

**Synthèse** Parmi les obstacles figuraient la crainte des complications et des effets secondaires de l'opération, les coûts, le manque d'accessibilité, la perception que l'intervention est une solution temporaire ou de dernier recours, et des expériences négatives antérieures. Les facilitateurs incluaient les demandes directes par les patients, la motivation des patients, l'échec d'interventions antérieures pour perdre du poids et les comorbidités liées à l'obésité. Il était plus probable que les PSP qui avaient des connaissances à propos des risques et des bienfaits de la chirurgie bariatrique demandent une consultation pour leurs patients.

**Conclusion** Il est nécessaire d'offrir de la formation et des programmes de développement professionnel continu portant sur la chirurgie bariatrique pour améliorer les connaissances des PSP et leur capacité de prendre en charge des patients atteints d'obésité. De plus, l'éducation du grand public sur l'obésité, la gestion du poids et les options thérapeutiques accessibles peut habiliter les patients et leur famille à prendre en charge leur poids et à se prévaloir des traitements fondés sur des données probantes.

**O**besity, defined as having a body mass index (BMI) greater than or equal to 30 kg/m<sup>2</sup>, is a rising epidemic worldwide.<sup>1-3</sup> It is associated with reduced quality of life<sup>4</sup> and its metabolic effects can lead to obesity-related comorbidities such as cardiovascular disease, hypertension, type 2 diabetes mellitus, osteoarthritis, reproductive disorders, respiratory disorders, and some cancers.<sup>5</sup> These comorbidities are associated with substantial reduction in life expectancy and increased health care use and cost.<sup>5</sup> Obesity-related comorbidities can improve and possibly resolve following weight loss.<sup>5</sup>

Currently, there are 3 main options for weight loss in patients with obesity: lifestyle changes, pharmacologic interventions, and bariatric surgery. Of these treatments, bariatric surgery has been shown to be more effective than non-surgical therapies.<sup>6</sup> Bariatric surgery results in weight loss through complex mechanisms including alteration of bile flow, stomach size, anatomy and flow of nutrients, the vagus nerve, enteric gut and adipose hormones, satiety, lipid and cholesterol metabolism, incretins and glucose, energy metabolism, gut microbiota, and endoplasmic reticulum stress.<sup>7</sup>

Bariatric surgery greatly decreases overall mortality and the development of new health-related conditions in patients with morbid obesity (BMI ≥35 kg/m<sup>2</sup>).<sup>8</sup> One year after bariatric surgery, patients lost 23% of their total body weight after sleeve gastrectomy and 31% of their total body weight after Roux-en-Y gastric bypass.<sup>6</sup> These results were sustained over 3 to 10 years.<sup>9-11</sup> Obesity-related comorbidities resolve or improve in 75% to 90% of cases following bariatric surgery. Type 2 diabetes improves or resolves in more than 80% of patients.<sup>9-12</sup> Hyperlipidemia, hypercholesterolemia, and hypertriglyceridemia improve in more than 70% of patients.<sup>9-12</sup> Hypertension improves or resolves in more than 75% of patients, and obstructive sleep apnea resolves or improves in more than 80% of patients.<sup>9-12</sup>

Despite mounting evidence for the effectiveness of bariatric surgery to treat patients with obesity and obesity-related comorbidities, it is only available for 0.58% (or 1 in 171) of eligible adult Canadians per year.<sup>3</sup> Primary care providers (PCPs), as gatekeepers to bariatric surgery, contribute to the lack of access to bariatric surgery for eligible patients.<sup>13</sup> We conducted a systematic review of the literature to identify barriers to and facilitators of a PCP's decision to refer their patients with obesity for bariatric surgery.

## — Data sources —

The protocol for this review is registered in the National Institute for Health Research PROSPERO database for systematic reviews relating to health (PROSPERO registration number: CRD42018088704). We identified articles through searches conducted between November 2017 and February 2018, using MEDLINE, EMBASE, and

PsycINFO databases. We used the following MeSH terms in our search: *family physicians, family practice, primary health care, primary care physicians, bariatric surgery, gastric bypass, and gastroplasty*. Additionally, we used wildcards and Boolean non-MeSH terms including *family pract\$, general practice\$, family medicine, family physician\$, primary care, family doctor\$, primary medical care, general physician\$, general practitioner\$, primary care practitioner\$, and (bariatric or gastric\* or obes\* or metabolic or weight) within 2 words of (surger\* or operation\*)*. We did not place any limits on our search and searched the reference lists of included articles for additional articles. Two reviewers (L.C., N.C.) independently screened the citations and full-text articles to identify relevant articles of interest.

We selected articles for this review based on a set of inclusion and exclusion criteria. To be included in the review, an article needed to have been peer-reviewed, have been published in English, have PCPs as participants, and have examined factors that affected referral of adult patients for bariatric surgery. Articles were excluded if they focused on a pediatric population; looked at obesity management in general without a focus on bariatric surgery; did not explore factors that affected referral for bariatric surgery; or were review articles, abstracts, case reports, editorials, or pilot studies.

We appraised the methodologic rigour of each of the included studies using 2 critical appraisal tools. We used the Appraisal Tool for Cross-Sectional Studies to assess cross-sectional surveys and the Critical Appraisal Skills Programme Tool Qualitative Checklist to assess qualitative studies. We used the appraisal items in these tools to determine the validity and reliability of the study results. Two authors (L.C., N.C.) individually appraised each of the included studies for quality. Discrepancies between appraisals were resolved through consensus. We determined the methodologic quality of each individual study to be high, average, or low based on the results of the appraisal tools. We assessed the risk of bias across studies by ranking all included studies based on their methodologic strength.

Two reviewers (L.C., N.C.) independently extracted data from the included articles and resolved differences through consensus. Data extracted were summarized according to study design, study location, study population, study aims, sample size, and unique barriers to and facilitators of bariatric surgery referrals among PCPs. Since this was a systematic review of published studies no ethics approval was required.

## — Synthesis —

Our search strategy identified a total of 1128 citations, of which 882 were non-duplicate citations. We screened the 882 citations by applying our inclusion and exclusion criteria to their title and abstract, which resulted in 38 citations for full-text review. Following full-text review,

we identified 18 unique articles that were included in this systematic review. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram is depicted in **Figure 1**.

We identified 15 cross-sectional surveys conducted at local, provincial or state, or national levels (**Table 1**).<sup>14-28</sup> Sample sizes in these studies ranged from 57 to 484 participants and response rates ranged from 12.4% to 80.0%. The appraised quality of cross-sectional surveys varied from high to low (Appendix A: Table 1, available from **CFPlus\***). We also identified 3 qualitative studies that used focus groups and interviews of 10 to 16 PCPs that explored barriers to and facilitators of bariatric surgery

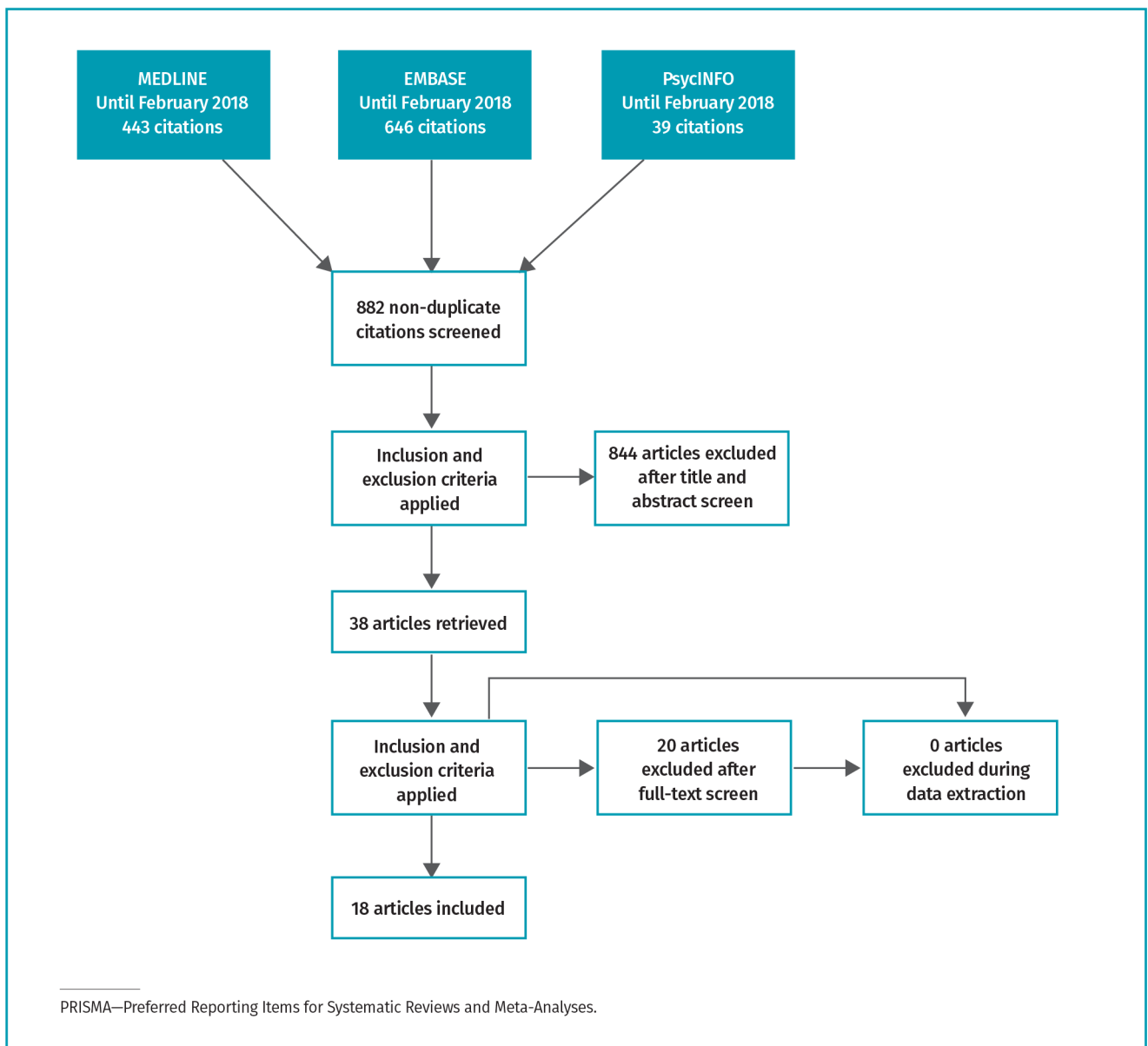
referral (**Table 2**).<sup>29-31</sup> The appraised quality of all 3 qualitative studies was high (Appendix A: Table 2\*).

### Study outcomes

We identified the following barriers: limited experience, knowledge, and education regarding bariatric surgery, concerns about risks of operative morbidity and mortality, concerns about follow-up care and long-term success after bariatric surgery, presumed prohibitive cost of procedure, and unfamiliarity with current guidelines for referral. We also identified the following facilitators: high patient BMI, presence of obesity-related comorbidities, highly motivated patients, and patient request to be referred for bariatric surgery. We discuss each of these barriers and facilitators below.

\*Appendix A is available from <https://www.cfp.ca>. Go to the full text of the article online and click on the **CFPlus** tab.

**Figure 1.** PRISMA flow diagram



**Table 1. Characteristics of included cross-sectional surveys**

STUDY INFORMATION	POPULATION	AIM OF STUDY	SAMPLE SIZE (RESPONSE RATE, %)	BARRIERS	FACILITATORS
Sarwer et al, Pennsylvania, 2012 <sup>14</sup>	Academic medical centre physicians and community-based physicians (primary care, internal medicine, endocrinology)	Local survey to investigate attitudes about referring patients with type 2 diabetes for bariatric surgery	93 (27.4)	Concerns about complications from bariatric surgery	<ul style="list-style-type: none"> <li>Experienced physicians</li> <li>Patient BMI &gt;40 kg/m<sup>2</sup></li> <li>Obesity-related comorbidities</li> </ul>
Tork et al, Cincinnati, Ohio, 2015 <sup>15</sup>	PCPs	To evaluate perceptions of the role of bariatric surgery in the treatment of patients with obesity and to identify possible barriers	57 (35.4)	<ul style="list-style-type: none"> <li>Cost of procedure</li> <li>Insufficient insurance coverage</li> <li>Concerns about long-term follow-up care after surgery</li> </ul>	NA
Al-Namash et al, Kuwait, 2011 <sup>16</sup>	PCPs	Survey of 3 health regions in Kuwait to identify why PCPs do not refer patients with morbid obesity for bariatric surgery	259 (80.0)	<ul style="list-style-type: none"> <li>Unfamiliar with referral guidelines</li> <li>Concerns about associated risks of morbidity and mortality of bariatric surgery</li> <li>Limited experience, knowledge, and education</li> <li>Overweight and obese physicians</li> </ul>	Female physicians
Auspitz et al, Ontario, 2016 <sup>17</sup>	FPs	Provincial survey to identify knowledge and perceptions of bariatric surgery	165 (12.4)	<ul style="list-style-type: none"> <li>Lack of resources</li> <li>Concerns about follow-up care</li> <li>Limited experience, knowledge, and education</li> <li>Cost of surgery</li> </ul>	<ul style="list-style-type: none"> <li>High patient BMI</li> <li>Patient obesity-related comorbidities</li> <li>Patient repeat attempts at dieting to lose weight</li> </ul>
Balduf and Farrell, North Carolina, 2008 <sup>18</sup>	FPs and internists	State survey to assess attitudes, knowledge, and bariatric surgery referral practices	268 (44)	Limited experience, knowledge, and education	<ul style="list-style-type: none"> <li>Patient request to be referred for bariatric surgery</li> <li>Younger physicians</li> <li>Physicians with recent medical school graduation</li> <li>Physicians with higher BMI</li> </ul>
Ferrante et al, New Jersey, 2009 <sup>19</sup>	FPs	State survey to assess practices and attitudes regarding care of extremely obese patients	255 (53)	Limited experience, knowledge, and education	NA

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STUDY INFORMATION	POPULATION	AIM OF STUDY	SAMPLE SIZE (RESPONSE RATE, %)	BARRIERS	FACILITATORS
Perlman et al, Connecticut, 2007 <sup>20</sup>	FPs	State survey to determine the level of knowledge and comfort in treating obese patients	129 (21)	<ul style="list-style-type: none"> <li>Concerns about associated risks of morbidity and mortality</li> <li>Belief that the patient would be unable to follow the postoperative lifestyle changes</li> <li>Limited experience, knowledge, and education</li> </ul>	NA
Avidor et al, United States, 2007 <sup>21</sup>	Physicians from 6 medical specialties: bariatric medicine, OB-GYN, internal medicine, endocrinology, cardiology, and family practice	Two surveys administered at national meetings: <ul style="list-style-type: none"> <li>To quantify and characterize the perceptions and practices in treating morbidly obese patients</li> <li>To understand why physicians refer so few of their morbidly obese patients for surgery</li> </ul>	<ul style="list-style-type: none"> <li>Survey 1: 478 (not reported)</li> <li>Survey 2: 484 (not reported)</li> </ul>	<ul style="list-style-type: none"> <li>Unfamiliar with referral guidelines</li> <li>Concerns about perceived risks of morbidity and mortality</li> <li>Concerns about follow-up care and long-term complications</li> <li>Unfamiliar with bariatric surgeons</li> </ul>	<ul style="list-style-type: none"> <li>Patient request to be referred for bariatric surgery</li> <li>Patient motivation</li> </ul>
Giaro et al, Poland, 2010-2012 <sup>22</sup>	General practitioners	Survey administered at educational conferences to assess the knowledge of bariatric surgery	282 (not reported)	Limited experience, knowledge, and education	NA
Jung et al, Germany, 2016 <sup>23</sup>	General practitioners and internists	National survey to examine the effect of stigma and knowledge on recommending weight-loss surgery and referral to a surgeon	201 (16.3)	<ul style="list-style-type: none"> <li>Limited knowledge of weight-loss surgery results</li> <li>Stigma toward weight-loss surgery</li> </ul>	Increased experience with weight-loss surgery
Major et al, Poland, 2016 <sup>24</sup>	PCPs (84.6%) and other physicians	National survey to assess knowledge of bariatric surgery and willingness to improve it in the future	206 (not reported)	Limited experience, knowledge, and education	NA
Martini et al, France, 2018 <sup>25</sup>	General practitioners	National survey to describe knowledge and attitude toward bariatric surgery	288 (12.9)	<ul style="list-style-type: none"> <li>Unfamiliar with referral guidelines</li> <li>Limited experience, knowledge, and education regarding bariatric surgery</li> </ul>	<ul style="list-style-type: none"> <li>Patient request to be referred for bariatric surgery</li> <li>High patient BMI</li> <li>Patient obesity-related comorbidities</li> <li>Knowledge of risks and benefits of bariatric surgery</li> </ul>

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STUDY INFORMATION	POPULATION	AIM OF STUDY	SAMPLE SIZE (RESPONSE RATE, %)	BARRIERS	FACILITATORS
Salinas et al, United States, 2011 <sup>26</sup>	FPs and general internists	National survey to identify relationships between attitudes, barriers, and current practice patterns to inform educational programming	293 (30)	<ul style="list-style-type: none"> <li>Lack of time during patient encounters</li> <li>Lack of knowledge and skill with weight management</li> <li>Lack of training in effective communication</li> <li>Lack of patient motivation</li> </ul>	<ul style="list-style-type: none"> <li>Increased physician confidence in assisting patients with weight management</li> <li>Increased physician confidence in managing patients after Roux-en-Y gastric bypass</li> </ul>
Stolberg et al, Denmark, 2017 <sup>27</sup>	PCPs	National survey to investigate referral patterns and possible reservations regarding bariatric surgery	133 (44)	Concerns about postoperative medical and surgical complications	<ul style="list-style-type: none"> <li>Patient request to be referred for bariatric surgery</li> <li>Patient BMI &gt;50 kg/m<sup>2</sup></li> </ul>
Sansone et al, Midwest, United States, 2007 <sup>28</sup>	FPs, internists, and OB-GYNs	Hospital survey to explore current opinions regarding morbid obesity and gastric bypass surgery	99 (40)	Concerns about associated risks of morbidity and mortality of surgery	Male physicians

BMI—body mass index, NA—not applicable, OB-GYN—obstetrician-gynecologist, PCP—primary care provider.

## Barriers to bariatric surgery referral

**Limited experience, knowledge, and education regarding bariatric surgery.** Ten out of 15 cross-sectional studies<sup>16-20,22-26</sup> and 1 out of 3 qualitative studies<sup>29</sup> addressed this topic. Primary care providers with no history of referral were less likely to discuss bariatric surgery with their patients and less likely to feel comfortable explaining procedure options and providing postoperative care.<sup>17</sup> Those PCPs were more likely to have just started their practice and had fewer patients with obesity.<sup>17</sup> A study from Poland found that only 8% of general practitioners had epidemiological awareness of obesity trends, knew the indications for bariatric surgery, and could apply their knowledge of bariatric surgery to make appropriate referrals.<sup>22</sup> In another study, PCPs did not have sufficient knowledge regarding the effectiveness and safety profile of contemporary bariatric surgery, with fewer than half (44%) of all PCPs reporting that they knew some or a lot about surgical interventions for obesity.<sup>19</sup> Similarly, a qualitative study from the United States reported that PCPs had limited knowledge about bariatric surgery and were unwilling to recommend surgery until patients had tried other weight management options.<sup>29</sup> Similar findings were also noted from PCPs in Kuwait.<sup>16</sup>

Those with prior education about management of obesity were more likely to counsel patients about bariatric surgery.<sup>18,21</sup> Similarly, PCPs who were aware of the

National Institute of Health's (NIH) guidelines on bariatric surgery and who completed continuing professional development (CPD) courses in obesity management were more likely to refer patients.<sup>18,21</sup> An increase in PCPs' knowledge of bariatric surgery, however, did not always result in increased willingness to refer patients for surgery.<sup>15</sup> In a study of PCPs from Cincinnati, Ohio, 65% reported being familiar with the indications of bariatric surgery and 70% reported being comfortable discussing it; however, only 9% of the PCPs indicated that they frequently or almost always referred their patients with morbid obesity for surgery.<sup>15</sup> This finding seems to suggest that additional factors may play a role in PCPs' decisions to refer a patient.

**Concerns about associated risk of morbidity and mortality of bariatric surgery.** Six out of 15 cross-sectional surveys<sup>14,16,20,21,27,28</sup> and 2 out of 3 qualitative studies<sup>29,31</sup> addressed this topic. Perceived risks of morbidity and mortality associated with bariatric surgery were the most common concerns reported by PCPs.<sup>20,21,27</sup> It was found that they generally overestimated the morbidity and mortality rates associated with surgery.<sup>18,20</sup> In 1 study, PCPs reported that postoperative vitamin deficiencies were difficult to correct.<sup>15</sup> Other studies reported that approximately 5% to 9% of PCPs believed that the risks of surgery outweighed the benefits.<sup>15,21</sup> In a survey

**Table 2. Characteristics of included qualitative studies**

STUDY INFORMATION	POPULATION	AIM OF STUDY	SAMPLE SIZE (RESPONSE RATE, %)	BARRIERS	FACILITATORS
Funk et al, Wisconsin, 2016 <sup>29</sup>	PCPs	Focus groups were conducted: <ul style="list-style-type: none"> <li>• To understand how PCPs make treatment recommendations to severely obese patients</li> <li>• To understand how PCPs prioritize the recommendations made to severely obese patients</li> <li>• To investigate how PCPs approach bariatric surgery as a treatment option and the challenges they encounter during the referral process</li> </ul>	16 (61.5)	<ul style="list-style-type: none"> <li>• Concerns about associated risks of morbidity and mortality</li> <li>• Cost and insurance coverage</li> <li>• Limited knowledge about bariatric surgery and long-term effectiveness</li> <li>• Poor reimbursement of physician time for patient counseling</li> <li>• Bariatric surgery considered a last resort</li> <li>• Distance that a patient has to travel to the bariatric clinic</li> <li>• Concerns about follow-up care after bariatric surgery</li> </ul>	<ul style="list-style-type: none"> <li>• Patient request to be referred for bariatric surgery</li> <li>• Patient motivation</li> </ul>
Jose et al, Tasmania, Australia, 2017 <sup>30</sup>	General practitioners	Interviews to examine their role in decision making about bariatric surgery for patients with obesity and their role in postoperative monitoring and support	10 (not reported)	<ul style="list-style-type: none"> <li>• Negative outcomes following surgery</li> <li>• Surgery considered a last resort</li> <li>• Concerns about providing follow-up care after surgery</li> <li>• Cost and insurance coverage</li> </ul>	<ul style="list-style-type: none"> <li>• Patient preference and request for bariatric surgery</li> <li>• Patient obesity-related comorbidities</li> </ul>
Kim et al, New South Wales, Australia, 2015 <sup>31</sup>	General practitioners	Semistructured interviews to explore decision-making factors and intentions in referring obese patients for lifestyle interventions or bariatric surgery	24 (75)	<ul style="list-style-type: none"> <li>• Concerns about associated risks of morbidity and mortality</li> <li>• Surgery considered a last resort</li> <li>• Cost of procedure</li> <li>• Lack of availability of procedure in public hospitals</li> </ul>	<ul style="list-style-type: none"> <li>• Patient expectation and request for referral for bariatric surgery</li> <li>• Patient comorbidities</li> <li>• Trustworthy surgeons and competent multidisciplinary team</li> <li>• Guidelines from professional bodies</li> </ul>

PCP—primary care provider.

of PCPs in Connecticut, most PCPs underestimated the expected weight loss at 1 year after gastric bypass surgery and did not believe that it resolved or substantially improved diabetes 80% of the time.<sup>20</sup> These misconceptions about contemporary bariatric surgery could influence a patient’s decision to consider it as an option.

**Concerns about follow-up care and long-term success following bariatric surgery.** Three out of 15 cross-sectional surveys<sup>15,17,21</sup> and 2 out of 3 qualitative studies<sup>29,30</sup> addressed this topic. Primary care practitioners reported feeling unprepared to provide good-quality, long-term

medical care to patients after bariatric surgery.<sup>15,17,21</sup> In the survey of PCPs in Cincinnati only 44% of the respondents felt comfortable providing follow-up care after surgery.<sup>15</sup>

**Cost and availability of bariatric surgery.** The issues of cost and insurance coverage were reported as barriers in 2 out of 15 cross-sectional surveys<sup>15,17</sup> and in 3 out of 3 qualitative studies.<sup>29-31</sup> In a study from Ontario, 35.7% of PCPs viewed the cost of surgery as a substantial barrier for patients accessing bariatric surgery, despite the fact that Roux-en-Y gastric bypass and sleeve gastrectomy (in select patients) are publicly funded by the



Ontario Health Insurance Plan.<sup>17</sup> Research from New South Wales in Australia found that the cost of and access to surgery were barriers for referral.<sup>31</sup> A study from Tasmania in Australia found that a publicly funded health program for bariatric surgery had long wait lists and limited accessibility.<sup>30</sup>

**Unfamiliarity with bariatric surgery referral guidelines.** Primary care practitioners' limited knowledge about NIH criteria regarding referral for bariatric surgery was reported as a barrier to patient referrals in 5 out of 15 cross-sectional surveys.<sup>16,17,20,21,25</sup> In a study from Ontario, 39.9% of PCPs did not agree with the NIH criteria that included a recommendation for bariatric surgery in patients with a BMI greater than 40 kg/m<sup>2</sup> without comorbidities.<sup>17</sup> In a national survey from France, only one-third of PCPs reported knowing the national guidelines for surgery.<sup>25</sup> Similarly, a national survey study from the United States reported moderate familiarity of physicians with the NIH guidelines, with physicians who had previously referred patients for surgery being far more familiar with the guidelines than physicians who had never referred.<sup>21</sup>

**Other barriers.** Prior negative experiences of patients with bariatric surgery was reported as a barrier in 1 of 15 cross-sectional surveys,<sup>24</sup> and the perceptions of bariatric surgery as a last resort and a quick or easy fix were reported in 3 out of 3 qualitative studies.<sup>28-30</sup> Jose et al reported that some PCPs recommended bariatric surgery only as a last resort when other obesity management approaches had failed.<sup>30</sup> There were conflicting results regarding PCPs' own BMIs and their referral patterns. A study from Kuwait reported increased likelihood of referral by PCPs who had a normal BMI,<sup>16</sup> whereas a study from North Carolina reported that PCPs who referred patients for bariatric surgery had a statistically significantly higher BMI when compared with PCPs who did not.<sup>18</sup>

## Facilitators of bariatric surgery referral

**Patient request and motivation to be referred for bariatric surgery.** Four out of 15 cross-sectional surveys<sup>18,21,25,27</sup> and 3 out of 3 qualitative studies<sup>29-31</sup> reported that patient request and motivation played important roles in prompting PCPs to initiate a referral for bariatric surgery.<sup>18,21,25,27,29-31</sup> These studies also reported that 50% or more of referrals tended to be prompted by a patient request. Among PCPs in France, 64% of bariatric surgery referrals were initiated at the request of the patient.<sup>25</sup> In Denmark, only 13% of PCPs reported initiating the conversation about surgery with their patients.<sup>27</sup> In the United States, some PCPs reported that a lack of patient interest in considering the treatment was often the reason they did not suggest it as an option.<sup>21</sup>

**High BMI and presence of obesity-related comorbidities.** Six studies in our review reported that a high patient BMI and presence of obesity-related comorbidities were facilitators.<sup>14,17,25,27,30,31</sup> In studies from Canada<sup>17</sup> and France,<sup>25</sup> PCPs reported that high patient BMI, presence of obesity-related comorbidities, and multiple attempts at dieting were the most common factors that influenced their decision to refer patients for surgery. In a national survey in Denmark,<sup>27</sup> approximately 20% of PCPs would initiate a referral only if patients with obesity also had obesity-related comorbidities; however, 40% of PCPs agreed to refer a patient if their BMI was greater than or equal to 50 kg/m<sup>2</sup>, even if they did not have obesity-related comorbidities.

**Other facilitating factors.** Primary care providers were more likely to refer patients for bariatric surgery if they had patients who had successful bariatric surgery,<sup>23</sup> if the operation was covered by insurance,<sup>30</sup> and if previous weight-loss interventions had failed.<sup>31</sup> They were also more likely to refer patients if they believed that surgery was safe and effective.<sup>26</sup> More years in practice was reported to be a facilitator of referral in 1 study<sup>14</sup> and a barrier in another.<sup>18</sup> Similarly, male PCP sex was reported to be a facilitator in 1 study<sup>28</sup> and a barrier in another.<sup>16</sup>

## Summary of synthesis

Our analysis of the 18 articles in this systematic review revealed several barriers to and facilitators of referrals for bariatric surgery. Identified facilitators included insurance coverage, presence of high BMI and obesity-related comorbidities, highly motivated patients who request a referral, prior failure of non-operative strategies, and PCP belief in the safety and effectiveness of bariatric surgery. Identified barriers included PCPs' limited knowledge and education about bariatric surgery, concerns about operative morbidity and mortality, concerns about follow-up care and long-term success of surgery, presumed prohibitive cost of the procedure, prior negative experiences by patients who had surgery, and limited knowledge about current bariatric surgery referral and practice guidelines.

## — Discussion —

Despite evidence that bariatric surgery results in sustained long-term weight loss,<sup>6,32</sup> improvement and resolution of obesity-related comorbidities,<sup>5,33</sup> and improvement in quality of life parameters,<sup>4</sup> bariatric surgery remains an underused intervention for patients with obesity.<sup>3,34</sup> Our results demonstrate that there is a discrepancy between the existing evidence supporting the use of bariatric surgery as an effective treatment for patients with obesity and PCPs' referral patterns. The gaps in PCPs' knowledge about the risks of contemporary bariatric surgery,<sup>34</sup> poor adherence to published

guidelines recommending bariatric surgery for treatment of patients with obesity and obesity-related comorbidities,<sup>35,36</sup> and limited experience with taking care of patients after surgery appear to be barriers to referral. Delivery of educational content on obesity management at undergraduate, postgraduate, and CPD levels may help address these gaps.

Our findings also reveal that PCPs tend to view bariatric surgery as a last-resort treatment option for patients with obesity. They are much more likely to refer patients for bariatric surgery after patients have tried all other non-surgical weight management options such as lifestyle changes and pharmacotherapies. While this pyramidal approach is commonly practised among PCPs, this view of bariatric surgery as a last resort is likely influenced by stigmas surrounding patients with obesity and PCPs' negative attitudes toward bariatric surgery. Unfortunately, obesity continues to be viewed as a self-afflicted lifestyle choice,<sup>37,38</sup> rather than as a "chronic, relapsing, multifactorial, neurobehavioral disease, wherein an increase in body fat ... result[s] in adverse metabolic, biomechanical, and psychosocial health consequences," as defined by the Obesity Medicine Association.<sup>39</sup> Obesity continues to be seen as a disease caused by poor choices, discounting the associated genetic and environmental components.<sup>40</sup> The stigma of obesity holds patients responsible for their disease, which in turn may motivate PCPs to continue to suggest lifestyle changes for patients with obesity. Additionally, the stigma associated with bariatric surgery may discourage both physicians and patients from considering surgery as a treatment option.<sup>41</sup>

We can make 3 recommendations from the results of this systematic review. First, education programs regarding surgical management of obesity should target not only PCPs, but also patients. A number of articles in our review identified PCPs' limited knowledge about bariatric surgery as a barrier to bariatric surgery referrals. Specific CPD courses for PCPs could be offered on the topics of obesity as a chronic multifactorial relapsing disease; on the risks, benefits, and clinical practice guidelines for medical and surgical treatment options for patients with obesity<sup>42,43</sup>; and the management of patients after bariatric surgery. Our findings also suggest that patients who advocated for a referral were more likely to be referred by their PCPs. For this reason, patients with obesity and their family members could be better educated on obesity as a disease and the treatment options that are currently available. With greater knowledge and comfort around obesity management, PCPs can be more confident and proactive in caring for their patients with obesity and patients can be better advocates for their own care.

Second, the practical barriers to bariatric surgery should be addressed through a health policy change. In alignment with the recommendations made by Obesity Canada in their *Report Card on Access to Obesity Treatment for Adults in Canada*,<sup>3</sup> obesity needs to be

recognized federally and provincially as a chronic disease, and policy changes should be enacted to increase accessibility of bariatric surgery. A consideration should be made to increase funding for bariatric surgery in light of evidence supporting its cost-effectiveness,<sup>44</sup> which may decrease the wait times for surgery. Costs incurred by patients for preoperative and postoperative care should be made available to PCPs, allowing them to have more informed conversations with their patients about the cost of bariatric surgery.

Third, a campaign that educates the general public on obesity to destigmatize the disease and its treatments should be considered, as more than 20% of the population of Canada has obesity.<sup>3</sup> A widespread education campaign could help shift public opinion toward more inclusive treatment options. This would build awareness of the actual causes of obesity and would promote prevention, empowering physicians and their patients to pursue effective, evidence-informed medical treatments for this disease.

Lastly, our results are in line with the paradox of primary care, which states that

compared with specialty care or with systems dominated by specialty care, primary care is associated with the following: (1) apparently poorer quality care for individual diseases, yet (2) similar functional health status at lower cost for people with chronic disease, and (3) better quality, better health, greater equity, and lower cost for whole people and populations.<sup>45</sup>

Care of patients with obesity as a chronic disease requires shared care models with integrated care provided by PCPs and selective care provided by bariatric surgeons. Such models of care will help maximize the value of health care for individuals and for the entire population.

## Limitations

Our results are limited by the quality and detail of the information presented in the studies that contributed to this systematic review. Some of the studies reviewed did not report the magnitude of the difference in referral rates for physicians who were managing patients with low and high BMIs. Thus, we were unable to report this information in our study. In addition, the studies reviewed did not provide sufficient information that would allow us to quantify the magnitude and report the relative importance of all the barriers examined. Further, while it may be interesting to examine differences in jurisdictional guidelines regarding bariatric surgery referral patterns, most of the studies reviewed did not provide this information.

## Conclusion

We conducted a systematic review of barriers to and facilitators of a PCP's decision to refer patients for

bariatric surgery. Most of the identified barriers can be addressed through education of current PCPs and through curriculum change for undergraduate medical students and postgraduate trainees. A general public education campaign to destigmatize obesity and to treat it as a chronic disease is also needed.

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#### Contributors

All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

#### Competing interests

None declared

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