Predictors of attrition in a multidisciplinary adult weight management clinic

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Background: Worldwide, more than 1.7 billion individuals may be classified as overweight and are in need of appropriate medical and surgical treatments. The primary goal of a comprehensive weight management program is to produce sustainable weight loss. However, for such a program to be effective, the patient must complete it. We analyzed attrition rates and predictors of attrition within a publicly funded, multidisciplinary adult weight management program.

Methods: We retrospectively reviewed charts from an urban multidisciplinary adult weight management clinic program database. Patients received medical or surgical treatment with appropriate follow-up. We collected information on demographics and comorbidities. Patients in the surgical clinics received either laparoscopic gastric band insertion or gastric bypass. We conducted univariate analysis and multivariate analyses on predictors of attrition.

Results: A total of 1205 patients were treated in the weight management program: 887 in the medical clinic and 318 with surgery and follow-up in a surgical clinic. Overall, 516 patients left the program or were lost to follow-up (attrition rate 42.8%). The attrition rate was 53.9% in the medical clinic and 11.9% in the surgical clinic. Multivariate analyses identified participation in the medical clinic, younger patient age and lower body mass index as predictors of attrition.

Conclusion: We found lower attrition rates among surgically than medically treated patients in a multidisciplinary weight management clinic. Further research is needed to understand those variables that lead to improved attrition rates.

Contexte : À l'échelle mondiale, on estime que plus de 1,7 milliard d'individus font de l'embonpoint et ont besoin de traitements médicaux et chirurgicaux appropriés. L'objectif principal d'un programme intégral de gestion du poids est d'obtenir une perte de poids durable. L'efficacité d'un tel programme dépend cependant de la persévérance des patients. Nous avons analysé les taux d'attrition et les prédicteurs de l'attrition dans un programme de gestion pondérale pluridisciplinaire public destiné aux adultes.

Méthodes : Nous avons passé en revue de manière rétrospective les dossiers de la base de données d'un programme clinique de gestion pondérale pluridisciplinaire destiné aux adultes en milieu urbain. Les patients ont bénéficié d'un traitement médical ou chirurgical et d'un suivi approprié. Nous avons recueilli des données démographiques et des données sur les comorbidités. Les patients des cliniques chirurgicales ont subi un cerclage ou un pontage gastriques laparoscopiques. Nous avons effectué une analyse univariée et des analyses multivariées sur les prédicteurs de l'attrition.

Résultats : En tout, 1205 patients se sont prévalus du programme de gestion pondérale : 887 à la clinique médicale et 318 à la clinique chirurgicale en vue d'une chirurgie et d'un suivi. De ce nombre, 516 patients ont quitté le programme ou n'ont pu être retracés au moment du suivi (taux d'attrition 42,8 %). Le taux d'attrition a été de 53,9 % pour la clinique médicale et de 11,9 % pour la clinique chirurgicale. Les analyses multivariées ont permis de reconnaître comme prédicteurs de l'attrition la participation à la clinique médicale, un âge moins avancé et un indice de masse corporelle plus faible.

Conclusion : Nous avons observé des taux d'attrition plus bas chez les patients traités chirurgicalement que chez les patients traités médicalement dans une clinique de gestion pondérale pluridisciplinaire. Il faudra des recherches plus poussées pour comprendre les variables propices à une amélioration des taux d'attrition.

More than 1.7 billion adults worldwide are considered overweight (body mass index [BMI] of 25–29.9), with about 300 million classified as clinically obese.[1] A diagnosis of obesity is generally defined as a BMI above 30. Obesity is related to numerous comorbid diseases, including hypertension, type 2 diabetes and musculoskeletal disease. The primary goal of a comprehensive weight management program is to produce sustainable weight loss. However, for such a program to be effective, the patient must first complete it.[2,3]

The Weight Wise Adult Weight Management Clinic (AWMC) of Alberta Health Services is a publicly funded, multidisciplinary weight management program that provides clinical treatment options for obese adults. Goals of the clinic are to enhance patients' health via lifestyle and behaviour modification. Patients must meet a set of criteria before becoming involved in the clinic. First, patients must complete at least 6 months of primary care weight management intervention, which includes attending a minimum of 4 of 10 Weight Wise Group Education Modules. These interactive workshops consist of funded 2-hour classes that provide people with weight management strategies and information on how to initiate treatment for obesity. Second, patients must undergo nutrition counselling with a registered dietician for a minimum of 6 months. Patients are required to keep a detailed journal of all food and beverage consumption and to document their feelings/emotions in conjunction with meals. Third, a physical activity or walking program with a pedometer is initiated. All patients undergo mental health screening by their family doctor or a mental health specialist to identify untreated mental health issues, such as depression, that may be barriers to effective weight management. Other medical conditions, such as hypertension, diabetes and dyslipidemia, are identified; however, the patient's primary care physician provides management and monitoring. Finally, all patients must be nonsmokers for a minimum of 3 months before entering the program.

Once the patient has satisfied the inclusion criteria, and a referral has been sent to the AWMC, an information package is provided to the patient. This outlines the clinic process, which typically lasts 6–9 months. The final decision regarding medical or surgical management is determined at the end of this time period. Patients deemed appropriate for surgery are then assessed by the surgeon and typically wait an additional 3–5 months for surgery.

After admittance into the program, the multidisciplinary team assesses patients. The Weight Wise team consists of registered nurses, dieticians, psychologists, occupational therapists, physical therapists, psychiatrists, internal medicine specialists and bariatric surgeons. Patients are required to attend about 10 clinic visits at 6-week intervals over a 9-month period. Visits are designed to be one-on-one with a clinician. The initial assessment is completed by the nurse/case manager and consists of a thorough patient history and discussion of patient expectations and program objectives. Treatment goals are established and agreed on. The first visit also includes evaluation by a dietician and physician. Follow-up by telephone is completed at 2 weeks to discuss goals and challenges. All subsequent visits involve meeting with the nurse, physician and dietician and other members of the multidisciplinary team for re-evaluation of treatment goals and to optimize the patient nutritionally, emotionally and medically. A treatment plan may include behaviour and diet modification, counselling, education, advice on exercise, pharmacologic treatment and bariatric surgery. The multidisciplinary team and the patient may consider surgical management as an option. The bariatric surgeon then assesses these patients and management continues in the surgical clinic. Surgically treated patients are then followed postoperatively for an additional 12 months as part of this program. Patients not deemed appropriate for surgical intervention are followed in the medical clinic until the completion of the 9-month program. Though the AWMC is a well established, rigorous and successful program, attrition remains a challenging issue. In the present study, we analyzed attrition rates and predictors of attrition in a multidisciplinary weight management program.

METHODS

We performed a retrospective chart review using an urban multidisciplinary adult weight management clinic program database (Weight Wise). The AWMC program includes obese adult patients treated medically and surgically in a comprehensive weight management program.

Participants

Participants included in our study were adult patients treated in either the medical or surgical clinics of the AWMC (Weight Wise) at an urban medical centre over a 6-year period from October 2002 to April 2008. We used patients' records to collect information on demographic characteristics and comorbidities. The patients in the surgical clinics were treated with either laparoscopic gastric band insertion or laparoscopic gastric bypass. Both the surgically treated and the medically treated patients underwent consultation with the multidisciplinary team regarding diet and lifestyle modifications.

Definition of attrition

Attrition was defined as loss to follow-up secondary to self-discharge, lack of interest, inability to commit time or discharge owing to poor compliance before completion of the program. Follow-up with the Weight Wise clinic is lifelong; for compliance issues, patients who miss more than 2 follow-up appointments are contacted via telephone and mail. In the medical clinic, this is defined as

leaving the program before 12 months, whereas in the surgical clinic this is defined as leaving postoperatively before 12 months. A thorough attempt is made by the case manager to contact the patient and discuss motivations/reasons for leaving the program. Contact is attempted by telephone, mail or through the patient's family physician. If the first attempt at contact with the patient fails, repeat contact is attempted every 3 months for a period of 1 year. After 1 year, if no response is obtained from the patient, this is defined as attrition. A multidisciplinary team consisting of internists, surgeons, dieticians, social workers, psychologists, psychiatrists, physiotherapists, registered nurses and program coordinators makes joint discharge decisions in cases of patients with poor compliance. Poor compliance is a summative effect of multiple factors, including failure to meet with health care professionals, failure to maintain a personal journal and daily food records, continued smoking, discontinuation of medications and lack of physical activity. Once the decision to discharge patients has been made, these patients, who meet the definition of attrition, are referred back to their family physicians.

Statistical analysis

Patients were divided into those who completed or continued (i.e., they were partway through the program at the end the study period but were in compliance) the program at Weight Wise and those who dropped out, as defined previously. We used descriptive statistics where appropriate. Univariate analysis was preformed to identify predictors of attrition, and results are presented as odds ratios. We used a logistic regression model for analysis of multivariate predictors of attrition. We considered results to be significant at $p < 0.05$. All calculations were performed using Stata 10 (StataCorp LP) statistical software. Variables were included into the model given their availability, importance and clinical relevance. We applied a purposeful selection procedure when fitting the model; age, sex and initial BMI were forced into the model because of their biological importance. Interaction effects were tested, and any significant interactions were kept in the model. We assessed confounding and removed all confounders. Model diagnostics were conducted to detect outliers and influential observations. Tolerance was used to test the colinearity of variables that were included in the model, and we removed low tolerance (< 0.1) variables.

RESULTS

A total of 1205 patients were treated at the AWMC during our study period, with 887 treated in the medical clinic and 318 treated surgically and followed in the surgical clinic. The baseline demographic characteristics of the participants are shown in Table 1.

Overall, 516 patients left the program or were lost to follow-up (attrition rate 42.8%). The attrition rate seen at the medical clinic was 53.9%, and that for the surgical clinic was 11.9%. As seen in Table 2, univariate analysis identified participation in the medical clinic as a predictor of attrition. Lower BMI at the time of admission into the AWMC program was also identified as a predictor of attrition. Other predictors of attrition included lack of musculoskeletal disease and bipolar disorder.

Age, sex, initial BMI, type of clinic, smoking history, active smoking, musculoskeletal disorder, mental health disease and mental health medication were used for multivariate analysis to identify predictors of attrition. As seen in Table 3, multivariate analysis also identified participation in the medical clinic as a predictor of attrition. Younger overall patient age (mean age 36.9 yr v. 42.6 yr, $p = 0.020$) and lower BMI were identified as predictors of attrition. No significant interaction or confounding effects were detected and model diagnostics indicated a good fit to the data. No low tolerance (< 0.1) variable was found, and there was no colinearity in the model.

DISCUSSION

The unrelenting increase in obesity in North America highlights the importance of effective weight management

Table 1. Demographic characteristics of the study population, $n = 1205$

Characteristic	Group; no. (%)*		
	Attrition	Compliance	Total
Patients	516 (42.8)	689 (57.2)	1205 (100)
Age, mean yr	42.2	43.0	42.6
Sex			
Female	545 (57.6)	401 (42.4)	946 (78.5)
Male	115 (44.4)	144 (55.6)	259 (21.5)
Weight, mean lb	135.5	146.5	141.8
Initial BMI, mean	48.4	52.3	50.6
Type of clinic			
Surgical	38 (11.9)	280 (88.1)	318 (26.4)
Medical	478 (53.9)	409 (46.1)	887 (73.6)
Smoking history	347 (44.2)	438 (55.8)	785 (65.1)
Active smoking	61 (47.3)	68 (52.7)	129 (10.7)
MSK disorder	225 (36.3)	394 (63.7)	619 (51.4)
Mental illness	245 (44.1)	310 (55.9)	555 (46.1)
Depression	210 (43.7)	271 (56.3)	481 (39.9)
Bipolar disorder	19 (61.3)	12 (38.7)	31 (2.6)
Eating disorder	11 (47.8)	12 (52.2)	23 (1.9)
Anxiety disorder	17 (31.5)	37 (68.5)	54 (4.5)
Anxiety disorder with panic attacks	24 (30.0)	56 (70.0)	80 (6.6)
On MH medication†	81 (34.8)	152 (65.2)	233 (17.7)
On antidepressants	68 (31.9)	145 (68.1)	213 (17.7)
On neuroleptics	8 (44.4)	10 (55.6)	18 (1.5)

BMI = body mass index; MH = mental health; MSK = musculoskeletal.
*Unless otherwise indicated.
†Includes selective serotonin reuptake inhibitors and antipsychotics.

programs. For a comprehensive weight loss program to be considered effective, it must lead to sustainable weight loss. Identifying those variables that predict attrition from a program may serve as a basis for program improvement and further research.[4]

Our experience at the AWMC program revealed an overall attrition rate of 42.8%, with an attrition rate from the medical clinics of 53.9%. Based on multivariate analyses, participation in the medical clinic was a predictor of attrition. Davis and Addis[5] completed a review of 20 studies related to medical treatment consisting of behaviour modification, which demonstrated that the rate of attrition ranged from 10% to 59%. Furthermore, they report a mean attrition rate from weight control studies of 32%.[5] These weight control studies consisted of cognitive–behavioural self-control, meditation, behavioural therapy and counselling.[6–9] A systematic review by Fabricatore and colleagues[10] of attrition from trials of pharmacological weight loss agents reported a similar attrition range of 11.0%–51.8%. Interestingly, the attrition rate from the AWMC surgical clinics was 11.9%. It is unknown, based on the variables assessed in this study, what specific factors may have led to this relatively low attrition rate. We speculate that patients willing to undergo the initial bariatric surgical procedure may be more committed to complete the program than those who don't undergo surgery. The surgically treated patients typically experience early weight loss, which serves as additional motivation to continue in the weight management program. Early weight loss has been reported to correlate with successful weight loss maintenance in a review by Elfhag and colleagues.[11]

Our study also identified younger age and lower BMI as predictors of attrition. Youth has been previously identified as a predictor of attrition in clinical multidisciplinary programs.[8] A greater percentage of female participants has also been identified as a predictor of attrition,[10] which may be related to a greater percentage of women participating in weight loss programs. Honas and colleagues[4] also reported age to be the significant demographic predictor of attrition. They speculated that the older population may be better committed to the program because of declining health or fewer familial obligations.[4] The relation between BMI and attrition has had conflicting results. Clark and colleagues[8] found younger age and lower BMI to be predictive of dropouts from the program; however, BMI has also been shown not to impact attrition rates.[4] It is possible that focusing resources on younger patients could reduce attrition rates.

Limitations

One of the main limitations of our study is that data on patient weight loss expectations were not available. In an observational multicentre study, weight loss expectations have been shown to be an independent predictor of attrition for patients entering a weight management program.[2] Furthermore, reaching a self-determined goal weight is reported to be associated with successful weight maintenance.[11] Managing patients' expectations may decrease attrition secondary to unrealistic expectations. Furthermore, patients' motivations for leaving the program or poor compliance cannot be quantitatively assessed based on their medical records. Therefore, important personal information cannot be quantitatively assessed using a retrospective study design. However, for those patients who did not return for follow-up, every attempt was made to initiate contact via telephone, mail or the family physician. Typically these patients could not maintain compliance with the rigorous program and recommendations for lifestyle change. A formal survey to patients, which is ongoing, may clarify their rationale.

CONCLUSION

By better understanding the variables that predict attrition

Table 2. Univariate analyses of risk of attrition		
Risk factor	Odds ratio	*p* value
Age, yr	0.99	0.19
Female sex	0.92	0.56
Weight, lb	0.99	< 0.001
Initial BMI	0.95	< 0.001
Type of clinic		
Surgical	0.12	< 0.001
Smoking history	1.17	0.18
Active smoking	1.22	0.28
MSK disorder	0.58	< 0.001
Mental illness	1.10	0.39
Depression	1.05	0.63
Bipolar disorder	8.62	< 0.001
Eating disorder	1.22	0.28
Anxiety disorder	0.60	0.09
Anxiety disorder with panic attacks	0.55	0.018
On MH medication*	0.55	< 0.001
On antidepressants	0.57	< 0.001
On neuroleptics	1.06	0.18

BMI = body mass index; MH = mental health; MSK = musculoskeletal.
*Includes selective serotonin reuptake inhibitors and antipsychotics.

Table 3. Multivariate analyses (logistic regression model) for risk of attrition		
Risk factor	Odds ratio	*p* value
Age, yr	0.98	0.012
Initial BMI	0.96	< 0.001
Surgical clinic	0.12	< 0.001
MSK disorder	0.70	0.009
Mental health disease	1.65	0.001
On MH medication*	0.06	0.004
Anxiety with pain attacks	0.50	0.018

BMI = body mass index; MH = mental health; MSK = musculoskeletal.
*Includes selective serotonin reuptake inhibitors and antipsychotics.

from a weight management program, we can continue to improve these programs to help obese patients achieve sustainable weight loss. Further research is needed to clarify why surgical patients have lower attrition rates and how these principles can be applied to nonsurgical patients in weight management programs.

Competing interests: None declared.

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