Preventive Medicine Reports 12 (2018) 12–19

Contents lists available at ScienceDirect

Preventive Medicine Reports

journal homepage: www.elsevier.com/locate/pmedr

Weight loss expectations and determinants in a large community-based sample

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ARTICLE INFO

Keywords:
Overweight
Obesity
Population studies
Weight loss expectations

ABSTRACT

While weight-loss expectations have primarily been studied in people enrolled in weight-loss programs, the present study explores patient expectations about weight-loss and identifies related determinants in a large, non-clinical population.

3916 volunteers (age > 18 years) participated in 2012 in a community-based survey in the French-speaking region of Belgium. Participants were asked to define "dream", "goal", "happy", "acceptable", and "disappointed" weights. Other self-reported measures were used to determine each participant's body mass index (BMI), body image discrepancy (BID), subjective norm (SN), weight loss activity, weight history, quality of life (QoL), and demographic and socioeconomic characteristics. The study focused on the determinants of unrealistic weight-loss "goal" (≥10% of initial weight).

Results showed median weight loss targets ranged from 5 kg ("disappointed" weight loss) to 21 kg ("dreamed" weight loss). Respondents considered the recommended weight-loss target (5–10%) disappointing. Severe and morbid obesity categories are at high risk of unrealistic weight loss goal. Unrealistic weight-loss goals was associated with female gender, weight loss activity, overweight history and lower QoL in overweight and moderate obesity respondents.

These findings confirm the urgent need to help patients accept more modest weight loss outcomes and the need for personalized care that considers the patient's specific profile and both weight loss expectations and determinants.

1. Introduction

Studies on overweight and obese people entering weight-loss programs have shown major discrepancies between patient expectations and clinical guidelines. While weight-loss recommendations advocate a five to 10% reduction in initial body weight (many obesity-related conditions are significantly improved with such modest/moderate weight loss) (National Heart Lung and Blood Institute, 1998), obese people want to lose at least two to three times that much weight. The study by Foster et al. (1997) is often cited as the first to address this issue. That survey showed that the average goal for sixty obese women (body mass index - BMI: 36.3 ± 4.3 kg/m^2) was a 32% reduction in body weight. A weight loss of 17 kg was considered disappointing, while a 25 kg loss was considered acceptable. Many other studies have confirmed these findings (Gelinas et al., 2013; Heinberg et al., 2010; Kaly et al., 2008).

Moreover, some studies suggest that people's failure to achieve their weight-loss goal leads to poor weight-loss outcomes such as unsatisfactory, negative emotions and even learned helplessness regarding the prospect of losing weight on their own in the future (Foster et al., 2001). In contrast, realistic expectations are associated with more positive health outcomes (psychological characteristics, eating behaviors,

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https://doi.org/10.1016/j.pmedr.2018.08.005
Received 15 February 2018; Received in revised form 4 July 2018; Accepted 3 August 2018
Available online 04 August 2018

and success rates) (Wamsteker et al., 2009; Teixeira et al., 2004).

In addition, overweight individuals' difficulty maintaining weight loss over the long term is well known (Wing and Phelan, 2005; Curioni and Lourenço, 2005). In this context, researchers like Fontaine and Barofsky (2001) argued that obesity management should focus more on monitoring and prevention than on curing, suggesting that it is more appropriate to help patients accept more modest weight-loss outcomes. There have been few studies, however, aimed at better understanding the factors that influence patient expectations and outcomes. The available data suggest that higher expectations are associated with personal, clinical, social, and psychological characteristics (Foster et al., 2001; De Vet et al., 2013; Fabricatore et al., 2008).

The majority of these studies focused on patients who were enrolled in weight-loss programs (*i.e.*, those who had consulted a physician or were hospitalized due, in some way, to their condition) (Dalle Grave et al., 2004, 2005). Less is known, however, about the weight-loss expectations and related determinants in the general population (De Vet et al., 2013; Fabricatore et al., 2008; Provencher et al., 2007). However, in terms of public health, better understanding of the experiences and insights of overweight individuals (not necessarily enrolled in weight loss programs) is necessary and important to better target health promotion and prevention strategies. Additional research is needed to assess patient expectations in a broader population.

Based on these observations, identifying the determinants of weight-loss expectations – in particular weight-loss goal - using a population-based survey represents a major public health challenge, and could lead to specific interventions that encourage overweight and obese individuals to accept more realistic weight-loss goals. The purpose of this study was to improve our understanding of patients' weight-loss goals and expectations by looking at a large non-clinical population not specifically selected based on BMI and not involved in a specific weight management program (although wanting to lose weight), and exploring the determinants of those goals and expectations. Specifically, the authors aimed to explore weight-loss expectation (in particular the risk of reporting a unrealistic weight-loss "goal" (≥10%)) and its correlation with some socioeconomic, demographic, quality of life, weight history, body image discrepancy and subjective norm variables in the "general" population.

2. Materials and methods

2.1. Study design and general approach

A survey was conducted in Wallonia (Belgium) as part of a larger project, EDUDORA[1] (which in French stands for "Therapeutic and preventive education on diabetes and obesity during adolescence and adulthood") (Scheen et al., 2010). That project focused on Therapeutic Patient Education (TPE) in two metabolic disorders: diabetes and obesity. Specifically, EDUDORA aimed to (1) improve the quality of care for diabetes and obesity prevention in adolescents and adults using a multidisciplinary approach focused on TPE, and (2) involve primary and secondary healthcare professionals in a synergistic way.

The present research is a cross-sectional study based on a quantitative approach. A multimedia advertising campaign was used to recruit participants (Pétré et al., 2015). A website was developed with a 31-item questionnaire to collect data on sociodemographic and anthropometric characteristics, quality of life (QoL), obesity-related life experiences, expectations about weight loss and management, and other obesity-related psychosocial issues. The only condition for participating in the survey was being 18 years of age or older. Every attempt was made to avoid stigmatization, as described in a previous paper by Pétré et al. (2015).

[1] **Edu**cation Thérapeutique et Préventive Face au **D**iabète et à l'**O**bésité à **R**isque chez l'**A**dulte et l'**A**dolescent.

2.2. Population

A community-based sample of 4155 adults was obtained covering a wide range of BMI values, including normal-weight respondents. Only subjects who expressed a willingness to lose weight were eligible for inclusion in the study, however.

2.3. Measures

2.3.1. Dependent variables - weight loss expectations

Consistent with Foster's original proposal (1997), people were questioned about five different weight outcomes: dream weight ("the weight you would reach if you could weigh whatever you want"), goal weight ("the weight realistically people expect to lose"), happy weight ("the weight that is not as ideal as the first one; it is a weight, however, that you would be happy to achieve"), acceptable weight ("a weight that you would not be particularly happy with, but one that you could accept, because it is less than your current weight") and disappointed weight ("a weight that is less than your current weight, but one that you could not view as successful in any way"). Weight-loss targets were calculated by deducting dream/goal/happy/acceptable/disappointed weight from current weight. Unrealistic weight-loss goal was defined as an expectation ≥10% of initial weight.

2.3.2. Independent variables

The demographic and socioeconomic characteristics were BMI, gender, age (years), subjective economic status (easy or difficult), level of education (primary, secondary, or tertiary), household size (1 or > 1) and perceived health (good or bad).

BMI was calculated as weight/height squared (kg/m^2). Height and weight were self-reported. BMI was categorized according to the BMI categories used by the World Health Organization (1998): normal weight ($18.5 \leq BMI < 25$), overweight ($25 \leq BMI < 30$), obese class I/moderate obesity ($30 \leq BMI < 35$), obese class II/severe obesity ($35 \leq BMI < 40$), and obese class III/morbid obesity ($BMI \geq 40$).

Other qualitative measurements were recorded, including body image discrepancy (BID), weight-related quality of life (WR-QoL), subjective norm (SN), and body weight history.

Body image discrepancy (BID): BID measures the "more or less" good visual estimation of the BMI by the subject. Participants were shown a series of nine body figures (1, smallest to 9, largest) asked to select which Stunkard et al. (1983) figure was the most closely resembling their current body size. BID was calculated by the following formula:

$$BID = self - reported\ BMI – average\ BMI\ for\ the\ selected\ figure.$$

Weight-related Quality of life (WR-QoL): QoL was assessed using a derived and simplified version of the French obesity specific quality of life questionnaire by Ziegler et al. (2005). Participants were asked to evaluate several aspects of life (physical and psychosocial) on a 4-point Likert scale (from total disagreement to total agreement) to know their feelings about 14 statements equally divided into physical problems (PHY-QoL) and psychosocial problems (PSY/SOC-QoL) (e.g.: "Because of my weight, I have trouble to dress or undress"). According to Ziegler et al., each response item was graded from 1 to 4 points (1 = total disagreement with the statement; 4 = total agreement). A score was calculated for both physical and psychological dimension by summing the respective items (range: 7–28 points). A total score (TOT-QoL) was also calculated (range: 14–56 points); the higher the score, the better the quality of life.

Subjective Norm (SN) is the perceived social pressure to engage or not to engage with a behavior, which is influenced by the importance each individual places on their appearance in the eyes of others. SN was calculated by asking the participants to respond to four statements using a four-point Likert scale (with 1 representing total disagreement with the statement and 4 representing total agreement) regarding the

following domains: (1) the importance they place on physical appearance compared with others, (2) what health professionals think of them, (3) what relatives think of them, and (4) what people, in general, think of them (e.g., "I attach great importance to what others think about me"). A total score was calculated (range: 4–16 points), and the higher the score, the more importance they placed on their appearance in the "eyes of others".[2]

Body weight history: respondents were asked if they were overweight or not during early childhood, childhood, and adolescence. Current weight loss activity was also investigated by asking respondents whether they were trying to lose weight or not.

2.4. Statistical analysis

Quantitative data were summarized by median and interquartile range (IQR: P25-P75). For qualitative variables, the number and percentage of subjects in each category were given. Distributions were also displayed graphically by Boxplots. Logistic regression analysis was used to determine the relationship between weight-loss goal ($< 10\%$ *vs.* $\geq 10\%$) and each determinant separately and in combination. The strength of association was measured by the odds ratio (OR) and its 95% confidence interval (95%CI). Calculations were always carried out on the maximum number of data available. No specific treatment of missing values was performed. Statistical tests were two-sided and results were considered significant at the 5% level ($P < 0.05$). Statistical calculations were done using SAS (version 9.4 for Windows) and R (version 3.3.1 for Windows).

2.5. Ethical considerations

The study was approved by the ethics committee of the University Hospital of Liège and patient were informed about the study goals. Collected data remained completely anonymous. Patient consent was assumed in view of the voluntary participation of the respondents and the lack of any pressure to participate.

3. Results

Of the 4155 subjects who completed the online questionnaire, 3916 (94.2%) were eligible based on the fact that they wanted to lose weight. Their characteristics are presented in Table 1. The median age was 47 (IQR: 36–57) years. The respondents were predominantly women (69.3%), had a high level of education (55.7%), and felt their income made it easy to deal with household expenses (55.9%). Eighteen percent lived alone. BMI values were distributed as follows: 336 (8.6%) normal weight, 1294 (33.0%) overweight, 1238 (31.6%) obese class I, 611 (15.6%) obese class II, and 437 (11.2%) obese class III.

Table 2 shows the median weight-loss targets expressed in kg and % of initial weight. Weight-loss targets ranged from 5 kg ("disappointed" weight loss) to 21 kg ("dreamed" weight loss), or from 6% to 24% of initial weight, respectively.

As observed in Fig. 1 focusing on weight-loss "goal", the higher the BMI category was, the higher was the weight-loss target. The median of "weight-loss goal" exceeded markedly 10% of initial weight for the "moderate", "severe obesity" and "morbid obesity" BMI categories.

Logistic regression showed that each parameter studied was significantly associated with weight-loss goal ($\geq 10\%$), except household size and SN (Table 3). When all of the parameters were combined in a multivariate analysis, gender, age, weight loss activity, overweight during childhood, BID, PHY-QoL, and PSYCHO/SOC-QoL remained significantly associated with a $\geq 10\%$ weight-loss goal. The probability of reporting a $\geq 10\%$ weight-loss goal was higher for females ($p = 0.01$) and younger people ($p = 0.02$), it was related to lack of weight loss activity ($p < 0.0001$), early childhood overweight ($p = 0.0088$), high BID ($p < 0.0001$), and low QoL ($p < 0.0001$). Corresponding ORs with 95% CI are displayed in Fig. 2.

Table 4 and Fig. 2 show the association between different determinants and an unrealistic ($\geq 10\%$) weight loss for each BMI category. Among respondents with a "normal" BMI, only gender ($p = 0.0038$), weight-loss activity ($p = 0.04$) and PSYCHO/SOC-QoL ($p = 0.02$) were associated with weight-loss goal in the multivariate model. Women, subjects with no weight-loss activity and with lower PSYCHO/SOC-QoL had a higher risk of reporting an unrealistic weight loss. Overweight respondents had the weight-loss target most strongly influenced by a set of eight covariates in the multivariate model, including gender ($p < 0.0001$), age ($p < 0.0001$), household size ($p = 0.05$), weight-loss activity ($p < 0.0001$), overweight during early childhood ($p = 0.03$), childhood ($p = 0.0079$), and adolescence ($p = 0.04$) and PSYCHO/SOC-QoL ($p = 0.003$). Women, younger people, living with others, subjects with no weight-loss activity, subjects who were overweight during early childhood and adolescence and with lower PSYCHO/SOC-QoL had a higher risk of reporting an unrealistic weight loss. Respondents with moderate obesity were influenced by five variables in the multivariate model: gender ($p = 0.02$), age ($p = 0.0004$), perceived health ($p = 0.0092$), weight-loss activity

Table 1
Demographic and socioeconomic characteristics of the survey sample, EDUDORA (2012).

Variable	Category	N	N (%) or median (IQR)
Gender		3916	
	Male		1204 (30.7)
	Female		2712 (69.3)
Age (years)		3916	47 (36–57)
Subjective economic status		3840	
	Easy		2146 (55.9)
	Difficult		1694 (44.1)
Education level		3877	
	Primary		256 (6.6)
	Secondary		1461 (37.7)
	Tertiary		2160 (55.7)
Household size		3905	
	1		707 (18.1)
	> 1		3198 (81.9)
BMI category		3333	
	Normal		336 (8.6)
	Overweight		1294 (33.0)
	Moderate obesity		1238 (31.6)
	Severe obesity		611 (15.6)
	Morbid obesity		437 (11.2)
Perceived health		3880	
	Bad		998 (25.7)
	Good		2882 (74.3)

Table 2
Weight-loss targets in the survey sample, EDUDORA (2012).

Weight loss category	N	Median (IQR) (kg)	Median (IQR) (% of initial weight)
Initial weight	3916	89 (78–103)	NA
"Dream" weight loss	3805	21 (14–32)	24.2 (17.1–33)
"Goal" weight loss	3820	15 (9–25)	17.5 (11.5–25)
"Happy" weight loss	3775	14 (8–22)	15.7 (10–22.6)
"Acceptable" weight loss	3747	11 (6–20)	12.8 (7.9–19.6)
"Disappointed" weight loss	3498	5 (2 − 10)	6 (3–10.5)

[2] The description of BID, SN, and WR-QoL was taken verbatim from Pétré et al., 2016.

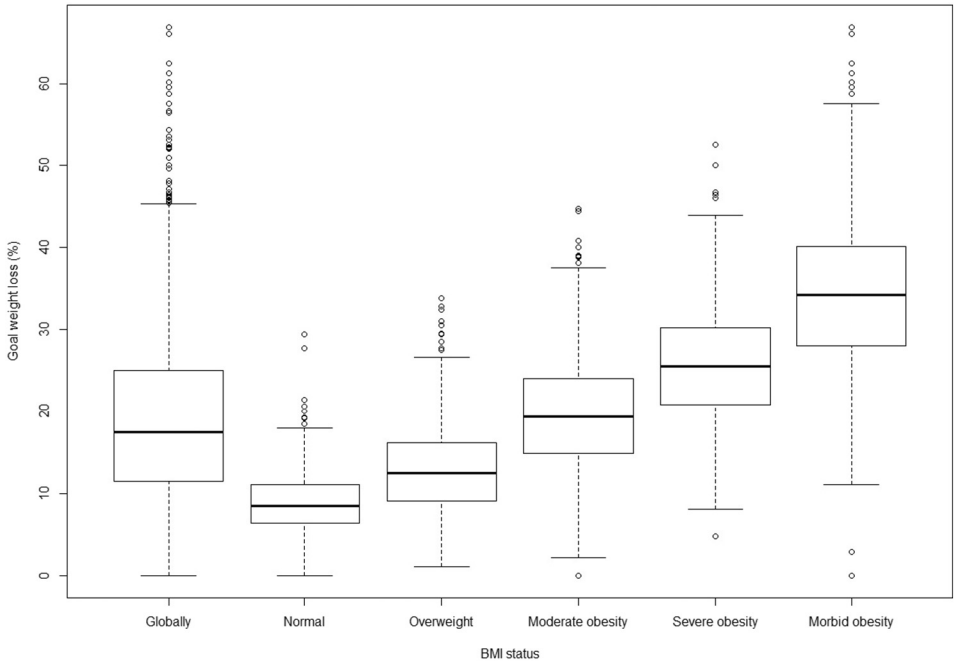

Fig. 1. Distribution of weight-loss "goal" according to BMI category, EDUDORA (2012).

($p = 0.0004$) and PHY-QoL ($p = 0.0019$). Women, younger people, bad perceived health, no weight-loss activity and lower PHY-QoL were associated with a higher risk of reporting an unrealistic weight loss.

We were unable to test statistically the difference between < 10% and ≥10% weight-loss goal for severe and morbid obesity categories. Distribution of respondents was disproportionate: the large majority of respondents (98.8% and 99.5% respectively) wished a ≥10% weight-loss goal.

4. Discussion

The aim of this study was to investigate a variety of weight-loss targets in a large non-clinical sample and the factors that influence them. Based on the responses of 3.916 subjects, the study provides new insights for managing weight-loss expectations and has practical implications.

It confirms previous findings regarding individuals' unrealistic expectations about weight loss. Moreover, it suggests for the first time

Table 3
Determinants of weight-loss goal assessed by logistic regression analysis ($n = 3820$).

		Weight-loss goal			
		< 10% ($n = 710$)	≥10% ($n = 3110$)	Univariate	Multivariate
Determinant	Category	Number (%)	Number (%)	*P* value	*P* value
Gender	Men	285 (40.1)	889 (28.6)	< 0.0001	0.01
	Women	425 (59.9)	2221 (71.4)		
Age, median (IQR)		48 (35–59)	47 (36–56)	0.039	0.02
Subjective economic status	Easy	509 (72.5)	1597 (51.9)	< 0.0001	0.07
	Difficult	193 (27.5)	1478 (48.1)		
Education level	Primary	34 (4.8)	212 (6.9)	< 0.0001	0.1
	Secondary	187 (26.6)	1246 (40.4)		
	Tertiary	483 (68.6)	1623 (52.7)		
Household size	1	130 (18.3)	544 (17.5)	0.63	0.05
	> 1	580 (81.7)	2558 (82.5)		
Perceived health	Bad	81 (11.5)	901 (29.2)	< 0.0001	0.49
	Good	624 (88.5)	2180 (70.8)		
Weight loss activity	Yes	495 (70.6)	1557 (50.4)	< 0.0001	< 0.0001
	None	206 (29.4)	1533 (49.6)		
Overweight during early childhood	No	545 (81.7)	2081 (70.6)	< 0.0001	0.0088
	Yes	122 (18.3)	868 (29.4)		
Overweight during childhood	No	581 (90.4)	2452 (85.0)	0.0004	0.96
	Yes	62 (9.6)	434 (15.0)		
Overweight during adolescence	No	463 (68.1)	1694 (56.1)	< 0.0001	0.79
	Yes	217 (31.9)	1325 (43.9)		
BID, median (IQR)		0.6 (−1.2–2.3)	2.2 (−0.3, 5.0)	< 0.0001	< 0.0001
SN, median (IQR)		11 (10−12)	12 (10−13)	0.056	0.17
QoL PHY, median (IQR)		22 (20–24)	20 (17–22)	< 0.0001	< 0.0001
QoL PSYCHO-SOCIO, median (IQR)		18 (16–20)	16 (14–18)	< 0.0001	< 0.0001

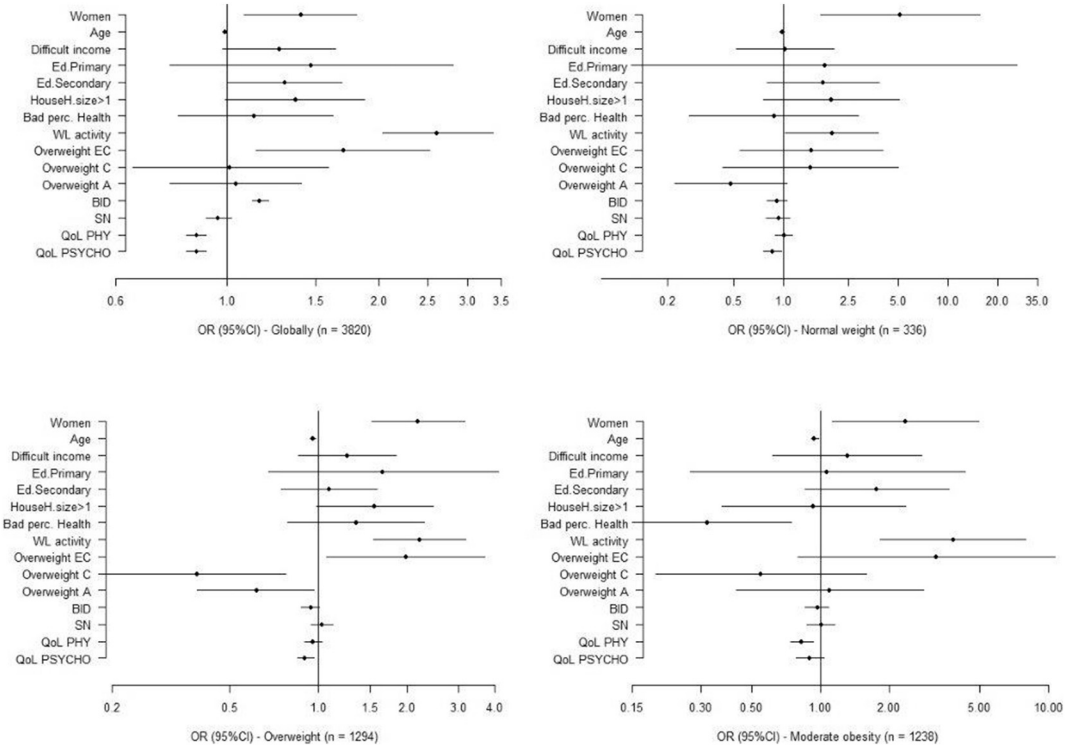

Fig. 2. Multivariate odds ratio (CI95%) of the determinants of weight-loss goal globally and according to the BMI status of individuals.

that the majority of individuals in a non-clinical sample have weight-loss targets exceeding the recommended 5%–10% reduction from initial weight (National Heart Lung and Blood Institute, 1998). The weight-loss targets in this study are more modest than those found in the first study by Foster et al. (1997), suggesting that non-clinical subjects tend to have more reasonable expectations than do clinical subjects. Specifically, non-clinical subjects have disappointed weight-loss wishes over 10% of their actual weight. Our results are in line with previous research focusing on a community-based sample (Fabricatore et al., 2008). In our study, the respondents considered the recommended weight-loss target (5–10%) disappointing.

Our study went a step further by examining the determinants related to reporting a ≥10% weight-loss "goal". To the best of our knowledge, this is the first time such associations were explored.

Our findings confirm previous studies that found that gender, BMI, and age are important determinants of weight-loss targets (Foster et al., 2001; Wamsteker et al., 2009; Fabricatore et al., 2008). Further, our research extends previous findings by demonstrating that socio-economic determinants play very little role in weight-loss targets. Indeed, subjective economic status, education level, household size, and SN do not seem to play a major role in determining individuals' weight-loss outcomes. While the relationship between obesity and low socio-economic status is well-established (WHO, 2014) our results are similar to those of previous studies comparing weight loss between participants of different socioeconomic status, which failed to find significant socioeconomic disparities in weight outcomes (Wing et al., 2004; Rautio et al., 2011). So while people are not at equal risk of obesity, that disparity does not seem to carry over to weight-loss expectations or success.

Our results showed that PHY-QoL and PSY/SOC-QoL were protective factors, respectively, for overweight and moderate obesity respondents. In other words, weight-loss expectations in overweight subjects were more determined by the psychosocial aspects of quality of life, whereas physical conditions were more influential in moderately obese subjects. This is essential, given the statement by Fontaine and Barofsky (2001) regarding the relationship between obesity management and individuals' quality of life. This calls for personalized support where the levers of action will not be the same according to the BMI category of people (Crutze et al., 2017). While our study helps demonstrate the association between QoL and weight-loss targets, future studies should explore any causal links between the two.

Crutze et al. (2017) showed the importance of BID and SN in obesity management and how these play a role in mediating/moderating the relationship between BMI and QoL. Our results failed to confirm the importance of BID and SN on weight-loss targets when considering a multivariate approach.

Regarding weight history, we only observed an effect in overweight people. While overweight during early childhood was considered as a risk factor of unrealistic goal weight loss, our results showed the opposite effect for overweight during childhood and adolescence. Future studies will try to help understanding how overweight history does influence people weight-loss expectations.

One reassuring result is that individuals who declare themselves in an approach to losing weight ("weight loss activity") tend to report more realistic weight-loss goals. This result can be seen as the fact that obesity prevention campaign and management in Belgium is effective in bringing individuals back into realistic expectations.

Another novel finding is that the determinants of weight-loss targets, in particular of realistic weight-loss "goal", vary with individuals' BMI category. The most prominent result is related to the severe and morbid obesity categories. People included in these categories are at high risk of unrealistic weight-loss goal. Our study failed to find protective factors of realistic weight-loss goal due the large proportion of people who reported a weight-loss goal ≥ 10%. For other BMI categories, gender, weight-loss activity, overweight history and QoL seem to represent important variables of interest when discussing weight-loss goal with individuals. Hence, managing obese patients requires a more personalized approach that takes into account the fact that both weight loss targets and related determinants can vary depending on the BMI status of the individual.

This study has some limitations. It was based on a voluntary and spontaneous participation of individuals in the survey; thus the sample

Table 4
Determinants of weight-loss goal according to the BMI status of individuals.

		Normal weight (n = 336)				Overweight (n = 1294)			
		Weight-loss goal				Weight-loss goal			
		< 10% (n = 212)	≥10% (n = 114)	Univariate	Multivariate	< 10% (n = 402)	≥10% (n = 1260)	Univariate	Multivariate
Determinants		n (%)	n (%)	P value	P value	n (%)	n (%)	P value	P value
Gender	Men	42 (19.8)	6 (5.3)	0.0004	0.0038	195 (48.5)	217 (25.3)	< 0.0001	< 0.0001
	Women	170 (80.2)	108 (94.7)			207 (51.5)	641 (74.7)		
Age		38.5 (29–51)	35.5 (27–50)	0.15	0.5	50.5 (39.59)	44 (34–54)	< 0.0001	< 0.0001
Median (IQR)									
Subjective economic status	Easy	148 (70.1)	63 (56.3)	0.01	0.92	299 (75.1)	486 (57.8)	< 0.0001	0.24
	Difficult	63 (29.9)	49 (43.8)			99 (24.9)	355 (42.2)		
Education level	Primary	3 (1.4)	5 (4.4)	0.08	0.36	19 (4.8)	35 (4.1)	0.05	0.53
	Secondary	48 (22.9)	34 (29.8)			110 (27.6)	292 (34.4)		
	Tertiary	159 (75.7)	75 (65.8)			270 (67.7)	521 (61.4)		
Household size	1	33 (15.6)	15 (13.2)	0.56	0.16	78 (19.4)	136 (15.9)	0.12	0.05
	> 1	179 (84.4)	99 (86.8)			324 (80.6)	719 (84.1)		
Perceived health	Bad	19 (9.0)	14 (12.5)	0.32	0.83	41 (10.3)	158 (18.6)	0.0002	0.28
	Good	192 (91.0)	98 (87.5)			359 (89.8)	691 (81.4)		
Weight loss activity	Yes	145 (69.7)	69 (61.1)	0.12	0.04	281 (70.6)	460 (54.1)	< 0.0001	< 0.0001
	None	63 (30.3)	44 (38.9)			117 (29.4)	391 (45.9)		
Overweight during early	No	171 (84.2)	89 (82.4)	0.68	0.43	308 (82.8)	620 (77.4)	0.03	0.03
childhood	Yes	32 (15.8)	19 (17.6)			64 (17.2)	181 (22.6)		
Overweight during	No	179 (93.7)	101 (90.2)	0.26	0.54	325 (89.0)	724 (90.8)	0.34	0.0079
childhood	Yes	12 (6.3)	11 (9.8)			40 (11.0)	73 (9.2)		
Overweight during	No	131 (65.2)	76 (69.1)	0.48	0.065	275 (70.7)	536 (64.6)	0.04	0.04
adolescence	Yes	70 (34.8)	34 (30.9)			114 (29.3)	294 (35.4)		
BID		−0.69	−1.47	0.13	0.24	0.79	0.26	0.002	0.10
Median (IQR)		(−2.19;0.79)	(−2.6;0.96)			(−0.85;2.53)	(−1.27;2.14)		
SN		12 (11 − 13)	12 (11;13.5)	0.08	0.43	11 (10–12)	12 (10–13)	0.0002	0.46
Median (IQR)									
QoL PHY		23 (21–25)	22 (20–24)	0.09	0.82	23 (20–25)	21 (18–23)	< 0.0001	0.24
Median (IQR)									
QoL PSYCHO-SOCIO		17 (16–19)	17 (14–19)	0.03	0.02	18 (16–21)	17 (14–19)	< 0.0001	0.0033
Median (IQR)									

	Moderate obesity (n = 1238)				Severe obesity (n = 611)			Motbid obesity (n = 437)	
	Weight-loss goal				Weight-loss goal			Weight-loss goal	
	< 10% (n = 87)	≥10% (n = 1213)	Univariate	Multivariate	< 10% (n = 7)	≥10% (n = 597)	Univariate	< 10% (n = 2)	≥10% (n = 424)
Determinants	n (%)	n (%)	P value	P value	n (%)	n (%)	P value	n (%)	n (%)
Gender	45 (51.7)	368 (32.7)	0.0003	0.02	3 (42.9)	193 (32.7)	0.57	0 (0.0)	105 (24.9)
	42 (48.3)	758 (67.3)			4 (57.1)	397 (67.3)		2 (100.0	317 (75.1)
Age	58 (45–65)	49 (39–59)	< 0.0001	0.0004	48 (32–72)	48 (37–57)	0.82	43.5 (39–48)	46 (37–55)
Median (IQR)									
Subjective economic status	58 (69.0)	625 (55.8)	0.02	0.47	3 (42.9)	250 (42.8)	1	1 (50.0)	173 (41.4)
	26 (31.0)	495 (44.2)			4 (57.1)	334 (57.2)		1 (50.0)	245 (58.6)

(*continued on next page*)

Table 4 (*continued*)

	Moderate obesity (n = 1238)				Severe obesity (n = 611)			Motbid obesity (n = 437)	
	Weight-loss goal				Weight-loss goal			Weight-loss goal	
	< 10% (n = 87)	≥10% (n = 1213)	Univariate	Multivariate	< 10% (n = 7)	≥10% (n = 597)	Univariate	< 10% (n = 2)	≥10% (n = 424)
Determinants	n (%)	n (%)	P value	P value	n (%)	n (%)	P value	n (%)	n (%)
Education level	11 (12.8)	71 (6.4)	0.009	0.3	0 (0.0)	53 (9.1)	0.67	1 (50.0)	48 (11.5)
	25 (29.1)	480 (43.0)			4 (57.1)	271 (46.4)		0 (0.0)	169 (40.3)
	50 (58.1)	565 (50.6)			3 (42.9)	260 (44.5)		1 (50.0)	202 (48.2)
Household size	17 (19.5)	194 (17.3)	0.59	0.88	1 (14.3)	120 (20.4)	0.69	1 (50.0)	79 (18.8)
	70 (80.5)	930 (82.7)			6 (85.7)	469 (79.6)		1 (50.0)	341 (81.2)
Perceived health	18 (21.2)	306 (27.3)	0.22	0.0092	3 (42.9)	227 (38.9)	0.83	0 (0.0)	196 (47.1)
	67 (78.8)	814 (72.7)			4 (57.1)	357 (61.1)		2 (100.0	220 (52.9)
Weight loss activity	61 (70.9)	560 (50.0)	0.0002	0.0004	7 (100.0)	272 (46.3)	0.0047	1 (50.0)	196 (46.9)
	25 (29.1)	561 (50.0)			0 (0.0)	315 (53.7)		1 (50.0)	222 (53.1)
Overweight during early childhood	61 (73.5)	817 (75.4)	0.69	0.27	5 (71.4)	348 (62.4)	0.62	0 (0.0)	207 (51.9)
	22 (26.5)	266 (24.6)			2 (28.6)	210 (37.6)		2 (100.0	192 (48.1)
Overweight during childhood	72 (91.1)	916 (86.7)	0.26	0.1	5 (71.4)	425 (79.4)	0.6	0 (0.0)	286 (74.1)
	7 (8.9)	140 (13.3)			2 (28.6)	110 (20.6)		1 (100.0	100 (25.9)
Overweight during adolescence	55 (67.1)	674 (61.7)	0.33	0.84	2 (33.3)	270 (47.1)	0.5	0 (0.0)	138 (33.4)
	27 (32.9)	419 (38.3)			4 (66.7)	303 (52.9)		2 (100.0	275 (66.6)
BID Median (IQR)	2.78 (1.03;4.65)	2.25 (0.12;4.24)	0.03	0.59	3.86 (1.20–5.92)	4.34 (1.79–6.44)	0.61	18.4 (8.6–28.2)	7.3 (4.68–11.32)
SN Median (IQR)	10 (9–12)	12 (10–13)	0.0063	0.92	9 (8–11)	12 (9–13)	0.04	10 (9–11)	11 (9–13)
QoL PHY Median (IQR)	21.5 (19–23)	20 (17–22)	< 0.0001	0.0019	21 (17–24)	18 (16–21)	0.26	19 (19–19)	18 (15–20)
QoL PSYCHO-SOCIO Median (IQR)	19 (17–21)	16 (14–19)	< 0.0001	0.14	18 (14–19)	15 (13–18)	0.37	19.5 (18–21)	15 (12–17)

was not necessarily representative of the target population. However, the number of survey respondents allowed an adequate distribution of individuals in all BMI categories and statistical processing. Moreover, most studies on weight-loss goals in obesity have had smaller sample sizes and/or limited age ranges. Another limitation is that BMI was self-reported, so that under- or overestimation cannot be ruled out. However, because the survey was anonymous, this potential bias is probably minimal. The present study focused solely on individual-related factors, while previous studies have shown the importance of environment and media regarding weight-loss difficulties (Frederick et al., 2016; Puhl and Heuer, 2010). While this study was cross-sectional, the confirmation of causal associations would require longitudinal studies and experimental designs.

Given that even the best available obesity treatments produce weight loss of only about 10% of the initial weight after one year (Wing and Phelan, 2005), helping patients accept more modest outcomes seems necessary. Behavioral therapy considers realistic goal as one fundamental step for management of obesity (Jacob and Isaac, 2012). We note, however, that it has proved quite difficult to alter patients' perceptions about what is a reasonable weight loss (Fabricatore et al., 2008). Referring to Atkinson research on motivational determinants of risk-taking behavior (Atkinson, 1957; Atkinson and Litwin, 1960), unrealisitc weight-loss goal of obese people could be viewed as a psychological protective mechanism: higher objectives may help people not feeling guilty if not achieving expected results. Taking the perspectives and expectations of both patients and health providers into account, patient education and a patient-centered strategy (Miller and Stoeckel, 2015) would seem to be an interesting approach to negotiating reasonable weight-loss goals in obesity and overweight management. Because weight control and thinness remain societal gold standards, however, this is difficult. Thus educating people about the biological limits of weight loss and the medical benefits of modest weight loss and employing strategies to improve patients' body satisfaction, quality of life, and self-esteem should be key components in obesity management.

Funding

This work was supported by the European Regional Development Fund and the Belgian Public Health Authorities (Program INTERREG IV – 50WLL/3/3/136).

Conflicts of interest

None.

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