Obesity Research & Clinical Practice 13 (2019) 404–407

Contents lists available at ScienceDirect

Obesity Research & Clinical Practice

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

Attitudes and perceptions of the general public on obesity and its treatment options in Singapore

Phong Ching Lee[a,b,*], Sonali Ganguly[a,b], Hong Chang Tan[a,b], Chin Hong Lim[a,c], Weng Hoong Chan[a,c], Jean-Paul Kovalik[a,d], Alvin Eng[a,c], Jeremy Tan[a,c], Eugene Lim[a,c], Jasmine Chua[a], Kwang Wei Tham[a,b]

[a] Obesity and Metabolic Unit, Bowyer Block A Level 1, Singapore General Hospital, Outram Road, Singapore 169608, Singapore
[b] Department of Endocrinology, Singapore General Hospital, 20 College Rd., Singapore 169856, Singapore
[c] Department of Upper Gastrointestinal and Bariatric Surgery, Singapore General Hospital, 20 College Rd., Singapore 169856, Singapore
[d] Program in Cardiovascular and Metabolic Disorders, Duke-NUS Medical School, 8 College Road, Singapore 169857, Singapore

ARTICLE INFO

Article history:
Received 15 February 2019
Received in revised form 22 March 2019
Accepted 29 March 2019

Keywords:
Attitudes
Obesity
Perception
General public
Singapore
Asia

ABSTRACT

Data on attitudes and perceptions towards obesity are lacking in Asia. Participants who attended an obesity public forum were surveyed concerning obesity and its treatment options. Although obesity is generally accepted as a disease with biological underpinnings such as hormonal imbalances and slow metabolic rate, it is also regarded as an issue of personal responsibility. 65.1% believed that weight-loss medications are dangerous. 20.6% thought that pharmacotherapy is effective for weight loss, whereas 41.1% were unsure. Most believed that bariatric surgery could improve health (81.9%) and diabetes control (74.0%) although 64.1% were unsure of its risks.

Introduction

Obesity is a major public health challenge with established health risks, contributing to development of many other chronic diseases such as diabetes, cardiovascular disease, stroke and cancer. The prevalence of obesity continues to rise at an alarming rate, especially in Asia [1]. While the adverse impact of obesity on health is undisputed, there has been a longstanding debate on whether obesity is truly a "disease" with distinct pathophysiology, or just a "risk factor", or worse yet, a "lifestyle choice" that is borne of energy excess due to socially unacceptable behavioural flaws reflecting lack of willpower or discipline.

Over the past decade, the biological mechanisms underpinning obesity and weight homeostasis are increasingly well understood. Neurohormonal changes that lead to increased appetite coupled with decreased energy expenditure have been observed as a response to weight loss [2]. These physiological changes support the argument of obesity as a chronic, relapsing disease process. Indeed, multiple organisations and societies have now issued position statements recognising obesity as a disease [3,4].

In tandem with our understanding of the pathophysiology of obesity, major strides have also been made in the treatment of obesity. In recent years, bariatric surgery has emerged as a safe and effective option for the long-term treatment of clinically severe obesity and its related complications [5,6]. Similarly, several new drug compounds have been approved by the United States Food and Drug Administration over the past few years, and anticipated to be more widely available in the coming years.

The ACTION study from the United States reported interesting results on the attitudes and perceptions in the Western population [7], and there appears to be changing public attitudes towards obesity [8]. However, these data are lacking in the Asian population, and provides us with the opportunity to carry out a study on the attitudes and perceptions of the general public on obesity and its treatment options in Singapore.

Methods

This was a questionnaire survey of the general public who attended a public forum event on obesity at a tertiary centre in Singapore. The survey was designed to be available in two lan-

* Corresponding author at: Department of Endocrinology, Singapore General Hospital, 20 College Rd., Singapore 169856, Singapore.
E-mail address: lee.phong.ching@singhealth.com.sg (P.C. Lee).

https://doi.org/10.1016/j.orcp.2019.03.007
1871-403X/

Table 1
Questionnaire responses showing how much the participants agree or disagree with a particular statement.

List of survey questions	Percentage (%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Q1: Obesity is a disease	1.9	26.4	11.3	39.6	20.8
Q2: Obesity is due to lack of willpower or discipline.	0.9	15.0	13.1	45.8	25.2
Q3: Obesity is a lifestyle choice	3.7	13.1	9.3	54.2	19.6
Q4: Obesity is due to addiction to food	0.0	15.9	19.6	49.5	15.0
Q5: Obesity is due to hormonal imbalance	1.9	15.0	26.2	46.7	10.3
Q6: Obesity is due to slow metabolism	0.9	11.3	18.9	52.8	16.0
Q7: With healthy diet and exercise, everyone should be able to achieve healthy weight.	0.0	9.5	12.4	52.4	25.7
Q8: My weight loss is completely my responsibility.	1.0	2.9	5.7	61.0	29.5
Q9: I support taxing foods high in fat to decrease obesity.	3.8	14.3	22.9	48.6	10.5
Q10: I support taxing foods high in sugar to decrease obesity.	3.8	13.2	17.9	52.8	12.3
Q11: My doctor has previously discussed obesity management and encouraged me to lose weight.	0.0	8.3	15.6	59.4	16.7
Q12: Weight loss medications are dangerous.	1.0	7.8	26.2	57.3	7.8
Q13: Weight loss medications are effective for weight loss.	5.6	27.1	41.1	13.1	7.5
Q14: Bariatric surgery can lead to long-term weight loss.	0.0	12.4	34.3	46.7	6.7
Q15: Bariatric surgery is harmful and risky.	2.9	20.4	64.1	11.7	1.0
Q16: Bariatric surgery can improve health in those with severe obesity.	0.0	1.9	16.2	60.0	21.9
Q17: Bariatric surgery can improve diabetes control in those with obesity.	0.0	1.9	24.0	56.7	17.3

guages, English and Chinese. The survey was pre-tested among twenty healthcare professionals to assess clarity and relevance. Participation was entirely voluntary. Basic demographic data such as age, gender, and ethnicity were obtained. As part of the public forum, the participants' height, weight and body mass index (BMI) were also recorded. Participants were then presented with a series of statements concerning obesity and its treatment options, and were asked to rate how much they agree or disagree with the statements based on a five-point Likert scale.

Variables were extracted, explored, and presented as frequency (%) for categorical data, whereas continuous data were presented as either mean (S.D.) for parametric distribution or median (interquartile range) for non-parametric distribution. All analyses were performed using SPSS software (version 25; IBM Corporation, Armonk, NY).

Results

One hundred and seven survey forms were returned, out of 146 who attended the public forum (response rate 73%). Mean age of the participants was 52.7 years, and 68.2% were female. The ethnic composition of the cohort was 78.1% Chinese, 10.5% Indian, 6.7% Malay, and 4.8% of other races. Median BMI was 28.4 kg/m^2 (interquartile range: 24.2–34.7 kg/m^2). 23.8% of the participants were overweight (BMI 23.0–27.5 kg/m^2), 56.5% had obesity (BMI $\geq$ 27.5 kg/m^2) of which 32.7% had severe obesity (BMI $\geq$ 32.5 kg/m^2).

Responses to the questionnaire are summarised in Table 1 and Fig. 1. 60.4% of the participants agreed that obesity was a disease. However, 71% of those surveyed also thought that obesity was due to a lack of willpower or discipline and 73.8% considered it to be a lifestyle choice. 64.5% believed that addiction to food was the cause of obesity. Interestingly, most participants also felt that there are biological explanations for obesity, such as hormonal imbalances (57%) and slow metabolic rate (68.8%).

Nevertheless, the vast majority (78.1%) thought that a healthy weight can still be universally achieved with healthy diet and exercise. Obesity remains an issue of personal responsibility, with 80.5% believing that they should be solely responsible for managing their obesity and weight. When asked about public health measures to tackle obesity, almost two-thirds supported the taxation of foods high in sugar (65.1%) and high in fat (59.1%).

For those with obesity, 76.1% felt that their doctor was encouraging and had discussed obesity management with them. 65.1% of the participants believed that weight-loss medications are dangerous. Only 20.6% thought that pharmacotherapy is effective for weight loss, whereas 41.1% were unsure of the efficacy of these medications.

Over half of the participants believed that bariatric surgery could lead to long-term weight loss (53.4%), and most thought that surgery could improve health (81.9%) as well as improve diabetes control (74.0%) in those with severe obesity. 64.1% were unsure of the risks associated with bariatric surgery.

There was divergence in the actual versus perceived weight status amongst the study participants whereby 30.4% of those who were overweight perceived themselves to be "normal" and 66.7% of those with obesity perceived themselves to be either "overweight" or "normal". On the other hand, 29.4% of those who were of normal weight perceived themselves to carry excess body weight (Table 2).

Discussion

Over the recent years, several Western studies have examined the attitude of the lay public as well as healthcare professionals towards obesity. The ACTION study surveyed persons living with obesity and healthcare providers on their obesity-related attitudes, perceptions and behaviors [7]. Despite the exponential rise in the rates of obesity in Asia, there remains a paucity of data in this area. Hence, our study provides relevant insight into the attitudes and perceptions of the general population towards obesity in the Asian setting.

Although the majority of the study participants felt that obesity was a disease, most of them also felt that it was a lifestyle choice stemming from a lack of willpower or discipline. The vast

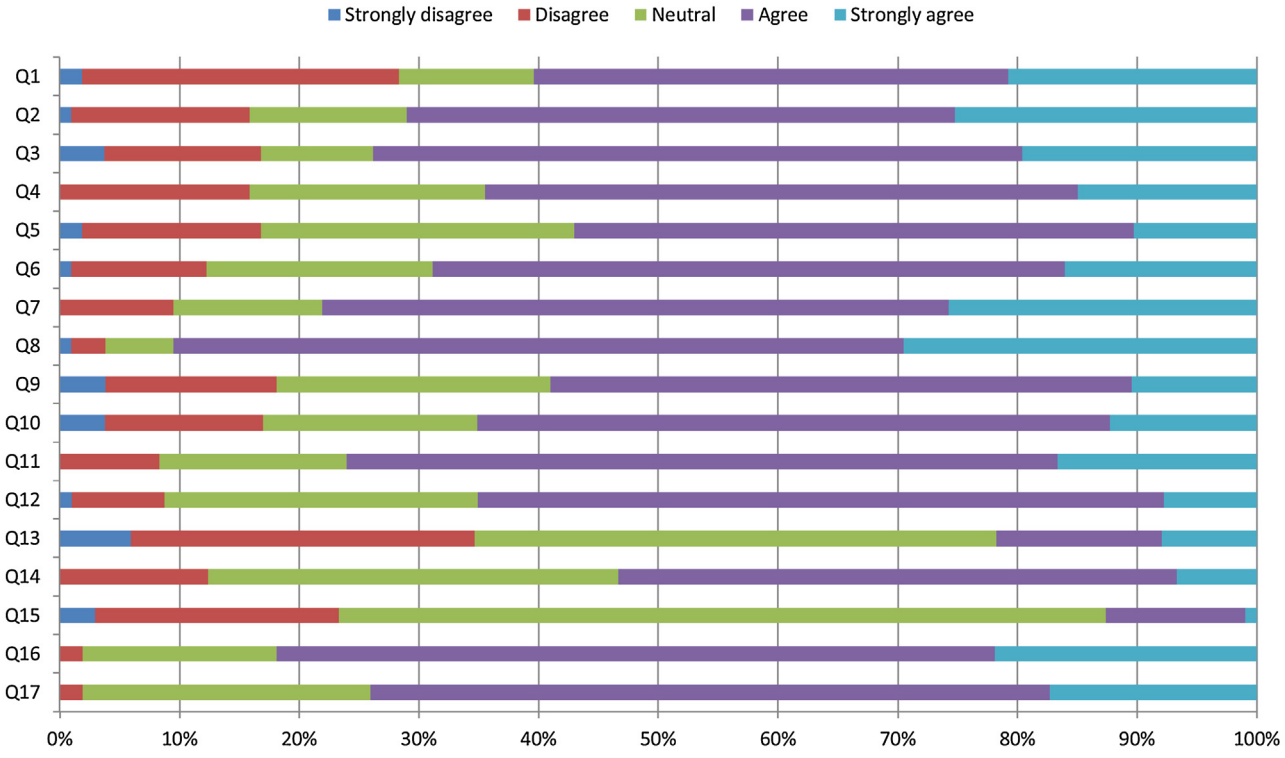

Fig. 1. Questionnaire responses based on Likert scale*. *List of questions are shown in Table 1.

Table 2
Perceived versus actual weight status amongst study participants.

	Actual weight status (n, %)						
	Underweight	Normal	Overweight	Obesity	Severely obesity	Total	
Perceived weight status	Normal	1 (50%)	12 (70.6%)	7 (30.4%)	1 (4.2%)	1 (3.0%)	22
	Overweight	0 (0%)	3 (17.6%)	14 (60.9%)	15 (62.5%)	5 (15.2%)	37
	Obesity	1 (50%)	1 (5.9%)	1 (4.3%)	6 (25.0%)	14 (42.4%)	23
	Severe obesity	0 (0%)	1 (5.9%)	1 (4.3%)	2 (8.3%)	13 (39.4%)	17
	Total	2	17	23	24	33	

majority regarded obesity management to be an issue of personal responsibility that can be universally addressed with appropriate diet and exercise. Increasing public awareness through education on the pathophysiologic basis of obesity and available treatment options would hopefully encourage those living with obesity to seek help, as well as help alleviate the stigma and discrimination they face.

Over the past decade, several notable advancements have been made in the development of effective anti-obesity pharmacotherapy that can be used in the long-term. If obesity were to be truly regarded as a bona fide disease, then a strong pipeline of medications would be crucial to effectively combat this chronic disease, similar to diabetes, hypertension or dyslipidemia. However, it is interesting that about two-thirds of our study population regarded weight-loss medications as dangerous, and most were either uncertain of its efficacy or did not believe they are effective for weight loss.

The unease surrounding weight-loss pharmacotherapy is understandable, given the cardiovascular and neuropsychiatric safety concerns that have led to withdrawal of several anti-obesity medications in the past (such as fenfluramine, sibutramine and rimonabant) [9]. However, to date, no safety signals have emerged to suggest that any of the currently available medications in Singapore are unsuitable for treating obesity. Recently, large cardiovascular outcome trials have demonstrated safety for some of the newer anti-obesity medications available in the United States such as liraglutide [10] and lorcaserin [11], whilst others are underway.

The divergence between actual versus perceived weight status amongst the participants was interesting. Two-thirds of those with obesity and 30.4% of those who were overweight had underestimated their weight status. This misperception could potentially lead them to delay or avoid addressing their obesity, as they do not see their weight as a health problem. Continued public health education and obesity-related awareness campaigns would be needed to close this “awareness gap”.

The majority of respondents supported fiscal measures involving taxation of unhealthy foods high in sugar and fat. Nevertheless, a sizeable minority do not agree with this measure, and further research on this issue would be important as a systematic review has shown that broad support from the general public is crucial in order for these non-traditional health taxes to be successful [12].

There are several limitations to our study. The sample size was small. Given that our study population involves participants who attended a public health forum on obesity, their views may not be representative of the population as a whole. Our survey was also conducted in English and Chinese, and those who were not conversant in either of those languages would not be represented. Nevertheless, we believe that our study findings are of significant

interest and would stimulate further discussion and research in this area.

Conclusion

Our survey has shed light on the Asian perspective of the general public's attitudes and perceptions on obesity and its treatment. We have found that although obesity is generally regarded as a disease with biological underpinnings, there remains a strong belief towards individual responsibility for managing the condition. Significant uncertainty and misconceptions surrounding the efficacy and safety of treatment options for obesity persist, particularly with pharmacotherapy and bariatric surgery. Continued and sustained health education efforts are thus vital to combat the stigma and prejudice faced by those suffering from obesity, as well as to provide appropriate evidence-based treatment options.

Ethical statement

We have read and have abided by the statement of ethical standards for manuscripts submitted to the Obesity Research & Clinical Practice.

Competing interest statement

All authors have no competing interests to declare.

References

[1] Collaboration NCDRF. Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. Lancet 2016;387(10026):1377–96.
[2] Heymsfield SB, Wadden TA. Mechanisms, pathophysiology, and management of obesity. N Engl J Med 2017;376(3):254–66.
[3] Garvey WT, Garber AJ, Mechanick JI, Bray GA, Dagogo-Jack S, Einhorn D, et al. American association of clinical endocrinologists and american college of endocrinology position statement on the 2014 advanced framework for a new diagnosis of obesity as a chronic disease. Endocr Pract 2014;20(9):977–89.
[4] Bray GA, Kim KK, Wilding JPH, World Obesity F. Obesity: a chronic relapsing progressive disease process. A position statement of the World Obesity Federation. Obes Rev 2017;18(7):715–23.
[5] Arterburn DE, Courcoulas AP. Bariatric surgery for obesity and metabolic conditions in adults. BMJ 2014;349:g3961.
[6] Puzziferri N, Roshek 3rd TB, Mayo HG, Gallagher R, Belle SH, Livingston EH. Long-term follow-up after bariatric surgery: a systematic review. JAMA 2014;312(9):934–42.
[7] Kaplan LM, Golden A, Jinnett K, Kolotkin RL, Kyle TK, Look M, et al. Perceptions of barriers to effective obesity care: results from the national ACTION study. Obesity (Silver Spring) 2018;26(1):61–9.
[8] Puhl RM, Liu S. A national survey of public views about the classification of obesity as a disease. Obesity (Silver Spring) 2015;23(6):1288–95.
[9] Cheung BM, Cheung TT, Samaranayake NR. Safety of antiobesity drugs. Ther Adv Drug Saf 2013;4(4):171–81.
[10] Marso SP, Daniels GH, Brown-Frandsen K, Kristensen P, Mann JF, Nauck MA, et al. Liraglutide and cardiovascular outcomes in type 2 diabetes. N Engl J Med 2016;375(4):311–22.
[11] Bohula EA, Wiviott SD, McGuire DK, Inzucchi SE, Kuder J, Im K, et al. Cardiovascular safety of Lorcaserin in overweight or obese patients. N Engl J Med 2018;379(12):1107–17.
[12] Wright A, Smith KE, Hellowell M. Policy lessons from health taxes: a systematic review of empirical studies. BMC Public Health 2017;17(1):583.