



Obesity and Bariatric Surgery awareness in the Kocaeli province, a leading industrial city in Turkey

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ABSTRACT

Objectives: An increase in the prevalence of obesity is a worldwide problem. It many serious health problems, especially cardiovascular diseases and type-2 diabetes mellitus. Conservative therapies such as diet modification and exercise are the most preferable obesity treatments. Bariatric surgery is the most appropriate treatment in suitable patients. Several studies showed that a very low number of patients prefer bariatric surgery even though it would be appropriate. This study aimed to assess and raise awareness about the obesity level, its complications, and treatment methods, especially bariatric surgery among obese patients in Kocaeli, which is one of the most socio-economically developed cities, as well as the leading industrial city in Turkey.

Material and Methods: A survey was designed to assess the knowledge about obesity, its complications, and bariatric surgery in the Kocaeli province. It was administered to 232 adult patients with a body mass index greater than 30 in different outpatient clinics where patients suffering obesity were treated.

Results: It has been seen that although the contribution factors and complications of obesity are well known, awareness of the body mass index was insufficient. Most of patients have tried to lose weight at least once and most patients have heard of bariatric surgery before. However, the details were not well known. The gastric band method is the most known method, and the most known risk of surgery was death. The main source of knowledge about bariatric surgery was television. The increasing body mass index affects patients' attitudes toward the surgery positively.

Conclusion: Knowledge of bariatric surgery is inadequate in the Kocaeli province, which is one of the most socio-economically developed cities, as well as the leading industrial city in Turkey. More social responsibility projects and more objective elucidating via television and social media are also needed to increase the awareness of bariatric surgery.

Keywords: Bariatric surgery, knowledge, Kocaeli, obesity

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INTRODUCTION

The rising prevalence of overweightness and obesity in several countries has been described as a global pandemic (1-3). Obesity and obesity-related diseases are replacing infectious diseases and malnutrition as the most significant health problem threatening the developing countries (4, 5). In 2008, the World Health Organization (WHO) pointed out that the worldwide obesity has nearly doubled since 1980 (1). This increasing trend is also shown by Lancet in 2014: more than 2 billion people are overweight, and of these, approximately 670 million people are obese (2). According to the data from the Nutrition and Health Research in Turkey—2010 conducted by the Republic of Turkey Ministry of Health, the obesity prevalence is 20.5% among adult men and 41.0% among adult women.

World Health Organization uses the body mass index (BMI) as a quantitative parameter to define obesity and being overweight. It defines obesity as a BMI greater than or equal to 30 kg/m² and being overweight as a BMI greater than or equal to 25 kg/m². The main risk factors that contribute to obesity are genetics, environmental factors, physical inactivity, energy intake, fetal nutrition, and cultural elements (1, 5). Obesity and overweightness can cause a wide range of serious health conditions including cardiovascular diseases such as stroke, hypertension, and heart diseases, diabetes mellitus; musculoskeletal disorders such as osteoarthritis; some types of cancers; and sleep-breathing abnormalities (1, 5, 6). Metabolic syndrome is also one of the most important complications of obesity, which comprises type 2 diabetes mellitus, hypertension, dyslipidemia, and insulin resistance (7-9). These obesity-related health problems cause significant treatment costs for these preventable diseases (10, 11).

When the prevention of obesity fails, the treatment of obesity may *become unavoidable*. These multidisciplinary treatment methods included lifestyle-based conservative interventions such as diet modification and exercise, medical approaches such as drug therapies, and bariatric surgery (10, 12). After previous unsuccessful attempts to lose weight with lifestyle-based conservative methods in patients with a BMI greater than 40 kg/m² or BMI ranging between 35 and 40 kg/m² with comorbidities, bariatric

surgery becomes the most effective treatment for obesity. It achieves a significant weight loss and eases comorbid illness in eligible patients (13, 14). Sleeve gastrectomy and gastric bypass are the most common techniques to perform a bariatric surgery. However, globally, the number of eligible patients who undergo bariatric surgery is low. Bariatric surgery is not well-known as an alternative weight loss method (14, 15).

Kocaeli was the Turkey's 11th most populous city (population 1,722,795) in 2014, according to data of the Turkish Statistical Institute. More than 400 first-class and over 7,000 second- and third-class corporations are located in Kocaeli. Therefore, it is one of the leading industrial cities in Turkey. Kocaeli is also the

1511 appointments for 4 outpatient clinics
203 duplicated appointments
1308
232 missed the appointments
1076
224 patients did not sign the informed consent form
852
589 participants with body mass index <30 kg/m ²
263
26 incomplete surveys
237
5 previously operated bariatric surgeries
232 final population of survey

Variables	Body Mass Index (kg/m ²)			P
	30–34.9	35–39.9	≥40	
Gender				0.113
Female	89 (50.0)	63 (35.4)	26 (14.6)	
Male	34 (63.0)	11 (20.4)	9 (16.7)	
Outpatient Clinics				0.101
Endocrinology and Metabolism	54 (50.5)	35 (32.7)	18 (16.8)	
Diabetes and Obesity	34 (44.2)	30 (39.0)	13 (16.9)	
General Surgery	23 (71.9)	6 (18.8)	3 (9.4)	
Sleep Laboratory	12 (75.0)	3 (18.8)	1 (6.2)	
Age groups (Year)				0.336
18–25	2 (25.0)	5 (62.5)	1 (12.5)	
26–35	18 (66.7)	6 (22.2)	3 (11.1)	
36–45	30 (46.9)	25 (39.1)	9 (14.1)	
46–55	39 (48.8)	24 (30.0)	17 (21.2)	
56–65	22 (61.1)	11 (30.6)	3 (8.3)	
66–75	10 (66.7)	3 (20.0)	2 (13.3)	
>75	2 (100.0)	0 (0.0)	0 (0.0)	
Total	123	74	35	
Dats are presented as n (%)				

fourth most developed city after Istanbul, Ankara, and Izmir, according to the Socio-Economic Development Ranking Survey of Provinces and Regions (SEGE-2011) data of the Republic of Turkey Ministry of Development. Therefore, this study aimed to assess and raise the awareness level of obesity, its complications, and treatment methods, especially of bariatric surgery among obese patients in Kocaeli.

MATERIAL AND METHODS

This study started after obtaining an approval from The Ethical Committee of the Research Health Science Center, Kocaeli University. Then, 4 different outpatient clinics with the highest number of obese patients were determined by a preliminary study. The population of study consisted of patients who applied to these outpatient clinics (General Surgery, Endocrinology and Metabolism, Diabetes and Obesity Clinics, and Sleep Laboratory) during a 2-week period. The inclusion criteria for participation in the study were being over 18 years old, having a BMI greater than 30, signing an informed consent form, and not treated by bariatric surgery. A weighting machine (Beko W1; Beko, Istanbul, Turkey) was used to measure the weight and height of patients. A survey had been administered to these patients. The survey included questions that assess patients' personal info, awareness about obesity, BMI, obesity-related health problems, and weight loss methods, their previous experiences with weight loss, and their knowledge about bariatric surgery.

All statistical analyses were performed using the IBM Statistical Packages for the Social Sciences (SPSS) for Windows version 20.0 (IBM Corp.; Armonk, NY, USA). Kolmogorov–Smirnov tests were used to test the normality of data distribution. Continuous variables were expressed as median (IQR), and categorical variables were expressed as percentages. Comparisons of categorical variables between the groups were performed using the chi-squared test. The correlation between categorical variables was assessed by the Pearson correlation test, Kendal tau coefficient, and Cramer phi coefficient. A two-sided P-value <0.05 was considered to be statistically significant.

RESULTS

In two weeks, a total of 1511 appointments were made to the 4 outpatient clinics. The surveys were administered to 232 patients who were suitable according to the inclusion criteria (Table 1).

At the end of the study, it was seen that there was not a significant difference of distribution of patients' BMI between gender, applied outpatient clinic type, and age categories (Table 2).

The awareness of BMI was evaluated. Most of the patients (55.2%) had never heard of the BMI before, and only 13.4% knew their own BMI value. Among the 104 who knew the meaning of BMI, only 41 (39.4%) stated the obesity limit as 30 kg/m².

Some questions were about obesity-related health conditions. It showed that 79.7% of patients knew that diabetes, hypertension, and hyperlipidemia were complications of obesity. Heart attack (81.0%), sleep apnea and respiratory problems (58.6%), and joint diseases (69.0%) were stated as obesity-related health problems by patients.

Several weight loss methods had been tried by 86.2% of patients before. Among those patients, 89.0% tried diet modification, 72.0% exercise, and 9.0% used pharmacological methods to decrease their weight. After these attempts, 21.0% of them stated that they completely failed. On the other hand, 38.5% were partially successful, and 31.5% were successful. It has been observed that the most important factor of their failures was the lack of motivation (Table 3).

Knowledge of patients about bariatric surgery was assessed by the survey questions. Most of the patients (84.9%) stated that they had heard of bariatric surgery as a treatment method, but they didn't know the details of this method, its techniques, and risks. On the other hand, 15.1% of patients had never heard about bariatric surgery before. The gastric band tech-

nique (79.1%) was the most known bariatric surgery method among the patients who knew that bariatric surgery was a treatment method (Table 4). When patients had been asked about the sources of their knowledge about bariatric surgery, it was observed that television (76.1%) was the main source, and only 4.1% of patients stated that they had seen an informative brochure on this subject. Additionally, "death" was the most common answer (28.0%) when the patients were asked about complications of bariatric surgery (Table 5). At the end, it was seen that an increasing BMI significantly affects the positive attitude toward bariatric surgery (Table 6).

DISCUSSION

Obesity is also one of the most important health problems in Turkey as it is in the rest of the world. This study was worked on to evaluate the latest data on obesity, its complications, treatment methods, and bariatric surgery in the leading Turkish industrial city, Kocaeli.

Even though there is no difference between the BMI ratios and gender categories, there were more women who participated in this study than men. This might be showing that obesity is more common in women. However, it shows that obesity is generally common in public because there is no difference between the BMI groups. The results are compatible with other studies in the literature that there are more cases in the 30-50 age category than in other age categories (16). These study data are similar to those from other studies that have been made in the country side of Turkey; however, ratios are higher when it is compared with other studies abroad (16, 17).

Obese patients applied to several different departments, so this shows that obesity does not belong to one department and that it requires a multidisciplinary approach. Contributing factors for obesity are observed as socio-economic status, dietary habits, and lack of physical activity. Moreover, the importance of self-motivation in weight loss has been shown in the literature (18, 19). As a matter of fact, both bariatric surgery's and other medical treatment's main goals are reducing the patient's energy intake and facilitating the weight loss process. Data showed that patients are usually willing to lose weight, but they also need additional assistance for that.

In this study, it was shown that most patients are aware of obesity and its complications. On the other hand, they are not well informed about the treatment methods. As the main definition of obesity, the BMI term is not well known. This is similar to other studies that were conducted in Turkey (17).

Unfortunately, most of the sources of patients' knowledge about bariatric surgery were non-medical sources. A similar issue is also apparent in other medical subjects. These sources are increasing the awareness of these treatment methods; however, it also is causing false or insufficient informing of individuals. It is necessary to inform people with more certain and correct information; furthermore, more health care professionals should be involved into these campaigns.

It was observed that patients' attitudes toward bariatric surgery is becoming more positive with a higher BMI. This expected result might be due to the failed weight loss attempts with other methods. Although most of the patients' attitudes are negative

Table 3. Weight loss failure reasons

Weight Loss Failure Reasons	Ratio (%)
Resistance to weight loss	40.3
Economical	10.1
Lack of motivation	54.6
Stress and fear of failing	45.4
Family problems and lack of time	26.9
Others	36.1

Table 4. Knowledge of surgical techniques

Surgical Techniques	Ratio (%)
Intragastric balloon	37.2
Gastric band	79.1
Sleeve gastrectomy	51.2
Gastric bypass	25.6

Table 5. Knowledge about the complications of obesity surgery

Complications of Obesity Surgery	Ratio (%)
Death	28.0
Anastomotic leak and ulcer	11.2
Malnutrition	7.3
Severe weight loss	16.4
Gaining more weight	5.6
Psychological problems	10.3

Table 6. Attitudes toward obesity surgery

Would you prefer obesity surgery as a treatment method?	BMI: 30-34.9	BMI: 35-39.9	BMI: >40	p
No	80 (65.0)	42 (56.7)	9 (25.7)	
Maybe, if it's necessary	30 (24.4)	19 (25.7)	7 (20.0)	
Yes	13 (10.6)	13 (17.6)	19 (54.3)	
Total	123	74	35	<0.001

BMI: body mass index
 Datas are presented as n (%)

due to the complications of bariatric surgery, a considerable number of patients view bariatric surgery positively. Patients stated the death as the most known complication of bariatric surgery. The source of this excessive fear were mostly television and the internet. It has also been understood that there are not enough brochures about this subject. If the true numbers about the bariatric surgery complication were told to patients, their fear would be decreased (20). The most known method for bariatric surgery was observed as a gastric band. However, it is less preferable nowadays as it is seen in the literature (20).

CONCLUSION

This study has shown that the knowledge of bariatric surgery is inadequate in the Kocaeli province, which is one of the most socio-economically developed cities, as well as the leading industrial city in Turkey. Public informative brochures that comprise updated scientific data about obesity and bariatric surgery are needed. In addition, more social responsibility projects are also needed to increase the awareness of obesity and bariatric surgery.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of the Kocaeli University Research Health Science Center.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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