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Knowledge, attitude and practice of bariatric surgery among primary care physicians in Riyadh, 2020

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ABSTRACT

Objectives: This study aimed to determine knowledge, attitude and practice of bariatric surgery among PHCP's in Riyadh, Saudi Arabia. *Methods:* From September to December 2020, a 43-question questionnaire was developed and delivered to all PHCPs practicing in Riyadh, Saudi Arabia, using social sites and participants' emails (n= 202). *Results:* One hundred thirty people answered. Male respondents made up 84.6 percent of those who assessed their BMI at each visit (p=0.037). Males were also more likely to initiate or refer to bariatric surgery discussions (p=0.001 and p=0.028, respectively). More than half of the participants had little understanding about bariatric surgery, with those older than 30 years old and with more than 5 years of experience having the most knowledge (p= 0.009, p= 0.012). Physicians who encounter patients between 11 and 20 hours each day and work in primary care clinics had a positive attitude (p=0.005, p=0.043). *Conclusions:* Overall, male participants performed better in primary care for obese individuals. A knowledge gap concerning the function of bariatric surgeries has been discovered, particularly among younger physicians.

Keywords: primary health care physicians, obesity, Bariatric surgery, Knowledge, Attitude, Perception

1. INTRODUCTION

Obesity prevalence rates over the last few decades have reached pandemic proportions (Angrisani et al., 2015). It is not only associated with greater risk of disability, the linkage between obesity and premature death is also well established (National Institutes of Health NIH, 1998; Toprak et al., 2015; Mofti & Al-Saleh, 1992; Ye et al., 2017; Dogan et al., 2015; Alqarni, 2016). According to WHO estimates, obesity is a global epidemic. In 2008, 1.5 billion adults worldwide were overweight, with over 300 million women and over 200 million men falling into this category (Alqarni, 2016). In Saudi Arabia, It has

been reported that for every 10 individuals, 7 complain of overweight or obesity (Memish, 2014). Many factors play role in this, such as genetic factors, increased caloric intake with lifestyle westernization, and decreased physical activity (Alqarni, 2016; DeNicola et al., 2015). According to the World Health Organization, obesity is defined as a body mass index (BMI) of =>30 kg/m 210. 28.7% of all Saudis have a BMI above 30 kg/m^2 (Organization WH, 2000). As recommended by The National Institutes of Health (NIH), the management of obesity has multiple elements, starting with the trials of behavioural changes such as low-calorie diet and physical activity. Clinically severe obese patients who fail strict behavioural modifications are candidates for pharmacological or surgical weight reduction techniques (National Heart, 2000). In recent years, Bariatric surgery has emerged as an effective option for obesity management. However, there is still an existing stigma, surrounding the procedures among general population (Sikorski et al., 2013).

Primary care and family physicians have an important opportunity to educate and motivate obese patients about the importance of maintaining a healthy weight. Additionally, they have an important role in providing the primary medical care by addressing the needs, offering the optimal solutions or referrals for each patient (Rippe et al., 2001). Despite the significant role of primary health care physicians (PHCP's) and the magnitude of the problem, multiple barriers to obesity management have been reported in previous studies (Auspitz et al., 2016; Avidor et al., 2007; Conaty et al., 2019; Perlman et al., 2007). Limited resources for referral, inadequate knowledge and competence, concerns and misconceptions about the complications and false beliefs about the benefits of treatment are some stated barriers (Auspitz et al., 2016; Avidor et al., 2007; Conaty et al., 2019; Perlman et al., 2007; Mahmoud et al. 2021).

In a study that examined Ontario family physicians' knowledge and perceptions of bariatric surgery, the majority of the participants want to receive more education about bariatric surgery, and only 32.1 % had the appropriate equipment and resources to manage obese patients. 79.3 % and 33.9% were less likely to talk about bariatric surgery and less likely to feel comfortable explaining procedure choices and postoperative care, respectively. Other studies found that more than half of their enrolled physicians were not familiar with the NIH morbid obesity management guidelines (Avidor et al., 2007; Conaty et al., 2019). The aim of this study was to identify knowledge, attitude, and practice of bariatric surgery among PHCP's in Riyadh, Saudi Arabia.

2. METHODS

Study population

The study was carried out of all PHCP's practicing at the Ministry of Health, primary health care centers, military hospitals and public hospitals in Riyadh, Saudi Arabia. PHCPs in either private or governmental sectors were included. No exclusion criteria were applied.

Study design

In this cross sectional study, based on PubMed literature review as well as the expertise of family medicine at a large tertiary academic center, a preliminary questionnaire was generated. A focus group of family medicine consultants and a bariatric surgeon was held, and the feedback was utilized to validate and modify the questionnaire. The study tool was piloted on a group of 10 PHCPs to test the questionnaire's applicability, and a final version of the questionnaire was utilized to address the knowledge, attitude and practice of bariatric surgery among PHCPs in Riyadh, Saudi Arabia.

Data collection and analysis

An electronic form of the survey was developed using Google forms, and the survey link was freely distributed, during the period of September 2020 to December 2020, through social media networks and participants' emails, obtained from primary health care centers (n= 202). It consisted of 43 questions, divided into 4 sections. Eight questions addressed participants' demographics including age, gender, nationality, practice duration, type and sector, position, and patient load. The second section utilized 12 questions assessing physicians' practice: patient's measurements, applying non-surgical options, referral frequency, etc. Twelve questions tested the knowledge about criteria for surgery, postoperative rate of weight loss, morbidity and mortality rates for bariatric procedures. A cumulative knowledge score was developed based on the number of questions answered correctly, following scoring criteria: correct answer=1; wrong answer= 0. Knowledge status was then categorized into: poor knowledge= 0-4, good knowledge= 5-8, and excellent knowledge=9-12. The last section consisted of 11 questions evaluating physicians' attitude, opinions and barriers for considering surgery as an option for weight loss. A 5-point Likert scale ("strongly agree," "agree," "Neutral," "disagree," and "strongly disagree.") was used to assess physicians' attitude. Each question was given a scale from 1-5,

considering the positive attitude =5. The attitude status was further classified into three categories: unfavorable attitude = 11-25, neutral attitude= 26-40, and favorable attitude > 40.

Sstatistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 22. To describe data, frequencies and percentages were used for categorical variables, while mean, median and standard deviation for continuous variables. Since the tables are categorical, Chi-square was utilized to test for the differences between participants' demographic, practice, knowledge and attitude. Differences were considered significant at $P < 0.05$ at 95% confidence interval.

Ethical consideration

The ethical considerations for this study were accepted by the Institutional Review Board of King Abdullah International Medical Research Center (KAIMRC), where the survey was constructed. A cover letter explaining the purpose of the study was attached with the final version. Informed consents were obtained, and confidentiality was preserved.

3. RESULTS

Of the 202 surveys distributed to PHCP's, 65.3% responded (n=130). The mean age of participants was 33.22 (±SD7.79) years, and the mean number of years in practice was 7.86(±SD7.35) years. Respondents were evenly split into males (50%) and females (50%), and the majority were Saudi (90%). The mean age of male physicians was 35.38 (±SD 8.9), while for female physicians it was 31.06 (±SD5.8). Of the participants, 52.3% self-identified as residents, 36.2% as consultants, and 11.5% as general practitioners. The majority were practicing in Primary health centers (70%), and 91.5% of the respondents were working in the general Governmental sector. 44.6%of the participants have encountered 11-20 patients in the clinic per day. Table 1 summarizes demographic characteristics of participants.

Table 1 participant's demographics

	All respondents (N=130) N (%)
Age, years mean (SD) 30 years old or less Above 30 years less	33.22 (7.79) 75 (57.7) 55 (42.3)
Gender Male Female	 65 (50) 65 (50)
Nationality Saudi Non-Saudi	 117 (90) 13 (10)
Number of years in practice mean (SD) 5 years or less More than 5 years	7.86 (7.35) 73 (56.6) 56 (43.4)
Current job title General Practitioner Resident Consultant	 15 (11.5) 68 (52.3) 47 (36.2)
Practice type Primary center Secondary and tertiary centers	 91 (70) 39 (30)
Practice sector Governmental Private Both	 119 (91.5) 3 (2.3) 8 (6.2)
Patient volume Less than 10 patients	 35 (26.9)

11-20 patients	58 (44.6)
More than 20 patients	37 (28.5)
Values are presented as number (percent), unless otherwise specified	

Table 2 shows participants' practice stratified by gender. 82.3% of the respondents stated that patients' weight was measured at each visit. Additionally, 76.9% of the study participants measured patients' Body mass index (BMI) at each visit. 49.2% of the total respondents have seen 10 or more morbidly obese patients in the last month. The majority of the respondents (74%) have initiated conversations about bariatric surgery with at least one patient. For managing morbidly obese patients, near half of the respondents have access to appropriate recourses and equipments (59.2%), and the vast majority have knowledge of whom to contact when facing difficulties (73.8%). 64.6% have referred patients for bariatric surgery, and in the last 12 months, 41.8% have referred 10 or more patients. Most of the participants (85.4%) have always recommended exercise programs for weight loss, while only 8.5% recommended the use of medications. Overall, male participants showed better practice toward patients presenting to primary health care clinics. Out of the hundred participants who measured patients' BMI at each visit, male respondents comprised 84.6% (p=0.037). Compared to females, males were also more likely to initiate conversations about bariatric surgery with a patient and refer patients for bariatric surgery (p=<0.001 and p=0.028, respectively).

Table 2 participants' practice stratified by gender

Variable	All (n= 130)	Male (n= 65)	Female (n= 65)	p-value
measuring patient's weight at each visit	107 (82.3)	53 (81.5)	54 (83.1)	0.818
Measuring patient's BMI waist circumference	100 (76.9) 2 (1.5)	55 (84.6) 0 (0)	45(69.2) 2 (3.1)	0.037* 0.154
Seen 10 or more morbidly obese patients in the last month	64 (49.2)	33 (50.8)	31 (47.7)	0.199
Initiated conversations about bariatric surgery with a patient	97 (74.6)	59 (90.8)	38(58.5)	<0.001*
Access to appropriate resource and equipment for managing morbidly obese patients	77 (59.2)	39 (60)	38 (58.5)	0.858
Knowledge of whom to contact in case of difficulty managing patients with morbid obesity	96 (73.8)	49 (75.4)	47 (72.3)	0.690
Referred patients for bariatric surgery	84 (64.6)	48 (73.8)	36 (55.4)	0.028*
Referred 10 or more patients in the last 12months	34 (41.5)	17 (37)	17(47.2)	0.349
Recommend exercise programs to obese patients Always Frequently	 111 (85.4) 19 (14.6)	 55 (84.6) 10 (15.4)	 56 (86.2) 9 (13.8)	0.804
Recommend medications for weight loss Always Frequently Infrequently	 11 (8.5) 23 (17.7) 96(73.8)	 5 (7.7) 8 (12.3) 52 (80)	 6 (9.2) 15 (23.1) 44 (67.7)	0.236

Referral if a patient meets the criteria				
Always	63 (48.5)	34 (52.3)	29 (44.6)	0.664
Frequently	42 (32.3)	19 (29.2)	23 (35.4)	
Infrequently	25 (19.2)	12 (18.5)	13 (20)	
Values are presented as number (percent), unless otherwise specified				

Table 3 shows Physician knowledge about bariatric surgery. Almost 52% of the participants had poor knowledge about bariatric surgery while 48% had good knowledge, and none of the participants showed excellent knowledge. Table 4 demonstrates knowledge score stratified by demographics. Participants who were older than 30 years of age and had more than 5 years of practice significantly showed better knowledge in the univariate analysis (p= 0.009, p= 0.012). Graph 1 show the knowledge score differences by the two age groups.

Table 3 Physician knowledge about bariatric surgery

Variable	The correct answer	All (n=130)
Patient factors that influence decision to refer morbidly obese patients for bariatric surgery	BMI Comorbidities Number of attempts at dieting Use of pharmacotherapy	119 (91.5) 120 (92.3) 60 (46.2) 39 (30)
The NIH Criteria for bariatric surgery	BMI > 40	112 (86.2)
Months at which maximum weight loss occurs after surgery	18-24 months	3 (2.3)
Identification of the ideal type of procedures in term of weight loss in average morbidly obese patients	Roux-en-Y gastric bypass	17 (13.1)
Identification of the safest technique in performing weight loss surgeries	Endoscopic	17 (13.1)
Identification of the 30-days morbidity rate	Roux-en-Y gastric bypass (0–5%) Sleeve gastrectomy (0–5%) Adjustable gastric band (0–5%)	22 (16.9) 48 (36.9) 34 (26.2)
Identification of the 30-days mortality rate	Roux-en-Y gastric bypass (0.1–0.2%) Sleeve gastrectomy (<0.1%) Adjustable gastric band (<0.1%)	19 (14.6) 26 (20) 31 (23.8)
Months at which failure after bariatric surgery is considered if a patient fails to achieve or maintain >50% of excess weight loss	18-24 months	33 (25.4)
Values are presented as number (percent), unless otherwise specified		

Graph 1 Knowledge score stratified by participants' age

Table 4 knowledge score stratified by participants' demographics

Variable	k- score		
	Poor knowledge N (%)	Good knowledge	P-value
Age, years			0.009*
30 years old or less	46 (61.3)	29 (38.7)	
Above 30 years	21 (38.2)	34 (61.8)	
Gender			0.219
Male	30 (46.2)	35 (53.8)	
Female	37 (56.9)	28 (43.1)	
Number of years in practice			0.012*
5 years or less	45 (61.6)	28 (38.4)	
More than 5 years	22 (39.3)	34 (60.7)	
Current job title			0.084
General Practitioner	5 (33.3)	10 (66.7)	
Resident	41 (60.3)	27 (39.7)	
Consultant	21 (44.7)	26 (55.3)	
Practice type			0.267
Primary center	44 (48.4)	47 (51.6)	
Secondary and tertiary centers	23 (59)	16 (41)	
Practice sector			0.052
Governmental	65 (54.6)	54 (45.4)	
Private	0 (0)	3 (100)	
Both	2 (25)	6 (75)	
Patient volume			0.574
Less than 10 patients	20 (57.1)	15 (42.9)	
11-20 patients	27 (46.6)	31 (53.4)	
More than 20 patients	20 (54.1)	17 (45.9)	
Values are presented as number (percent), unless otherwise specified			

Table 5 shows participants' attitude. Many PHCPs agreed or strongly agreed to the following: dieting attempts for at least 6 months before considering surgery (74.7%), having morbidly obese patients who lost weight successfully without surgery (56.1%), bariatric surgery results in sustained weight loss (52.3%), feeling comfortable explaining the procedural options (58.5%), feeling competent to address the medical complications of bariatric surgery (56.2%), additional medical education in bariatric surgical care

would be useful (84.6%), referring a family member or a friend for gastric bypass surgery (64.4%), supporting metabolic surgery for diabetic patients with BMI< 35 kg/mg^2 (61.7%), benefits of surgery outweigh risks for severely obese patients (82.3%), cost of surgery is a significant barrier to care (67.7%). The univariate analysis showed physicians who see patients from 11-20 per day and who practiced in primary centres had a significantly favourable attitude (p=0.005, p= 0.043). Table 6 demonstrates participants' attitude score stratified by patient load and practice type.

Table 5 participants' attitude

Variable	Strongly agree N (%)	Agree	Neutral	Disagree	Strongly disagree
Morbidly obese patients should attempt dieting for at least 6 months before considering surgery	50 (38.5)	47 (36.2)	21 (16.2)	12 (9.2)	0 (0)
I have had morbidly obese patients who were successful at losing weight without surgery	25 (19.2)	48 (36.9)	38 (29.2)	17 (13.1)	2 (1.5)
Bariatric surgeries result in sustained weight loss	15 (11.5)	53 (40.8)	27 (20.8)	29 (22.3)	6 (4.6)
I feel comfortable explaining the procedural options to a patient	24 (18.5)	52 (40)	38 (29.2)	14 (10.8)	2 (1.5)
I feel competent to address the medical complications of bariatric surgery.	20 (15.4)	53 (40.8)	39 (30)	17 (13.1)	1 (0.8)
I feel comfortable providing care to patients who have received bariatric surgery	32 (24.6)	57 (43.8)	29 (22.3)	8 (6.2)	4 (3.1)
Additional continuing medical education resources in bariatric surgical care would be useful to primary care physicians in Riyadh	53 (40.8)	57 (43.8)	17 (13.1)	3 (2.3)	0 (0)
I would refer a family member or a friend for gastric bypass surgery	25 (19)	59 (45.4)	27 (20.8)	12 (9.2)	7 (5.4)
I am supportive of metabolic surgery for patients with diabetes who have a BMI < 35 kg/m2^	28 (21.5)	51 (39.2)	26 (20)	23 (17.7)	2 (1.5)
The benefits of bariatric Surgery outweighs the risks for severely obese patients.	46 (35.4)	61 (46.9)	21 (16.2)	1 (0.8)	1 (0.8)
The cost of surgery is a significant barrier to care	26 (20)	62 (47.7)	29 (22.3)	13 (10)	0 (0)

Table 6 participants' attitude score stratified by patient load and practice type

Variables	Favorable Attitude	Neutral Attitude	p-value
ALL (N=130)	54 (41.5)	76 (58.5)	
Patient volume			
Less than 10 patients	9 (25.7)	26 (74.3)	
11-20 patients	33 (56.9)	25 (43.1)	0.005*
More than 20 patients	12 (32.4)	25 (67.6)	
Practice type			
Primary center	43 (47.3)	48 (52.7)	0.043*
Secondary and tertiary centers	11 (28.2)	28 (71.8)	

4. DISCUSSION

Obesity has become one of the most prominent public health issues in Saudi Arabia, affecting citizens of all ages and genders (Al-Shehri et al., 2016). PHCPs' role in identifying possible bariatric surgery candidates is crucial. With the increased use of surgery to manage obesity, PHCPs' are encouraged to learn not only how to identify patients who may benefit from surgery, but also how to implement the principles that govern follow-up care and long-term surveillance (Presutti et al., 2004). The mean age of the study participants was 33 years, with an average working experience of 8 years. This young physician population, which has to cope with the trends of obesity and overweight management, represents an appropriate target for training efforts aimed at increasing obesity care in the primary health care facilities. There appears to be some differences in practice when physicians' gender was controlled. Male participants were significantly more likely to measure patients' BMI, initiate conversations, and refer patients for bariatric surgery. This could be the result of the older age of male participants in this study, which is a contributing factor to better practice and referral pattern. However, the practice-gender relationship may have been influenced by an indirect physician factor or uncorrected and unmeasured patient features, such as differences in patient's comorbidities and preferences that were not taken into account in the study.

This study presented that more than half of the study participants had poor knowledge scores. Sufficient knowledge about obesity and bariatric surgery in primary health care is an important element that might positively affect referral patterns and physicians practice. In a previous study, high knowledge was significantly correlated with better referral and positive attitude (Memarian et al., 2021). The finding of this study showed that patients who were older than 30 years and who had more than 5 years in practice demonstrated significantly better knowledge about bariatric procedures. This might be attributed to the impact of the higher experience levels and the longer duration of patient exposure on the general physician's knowledge. The increased incidence of negative attitudes of PHCP's about batiatric management might interfere with the willingness to engage obese patients in weight loss discussions. The present study provided an insight of the PHCP's attitude about obesity management and surgical intervention. Among the study population, positive attitude was significantly associated with higher patient volume. Similarly, the findings of Ferrante et al., (2009) support ours. The participants who practiced in primary centers significantly demonstrated a more positive attitude. Perhaps, this might be explained by the high patient numbers encountered in primary care centers, leading to the development of physicians' tolerance toward patients with obesity.

The study findings should be interpreted in the context of its limitations. In addition to the relatively small sample size, the limited population of PHCP's, exclusively practicing in Riyadh, that were enrolled in this study, hinder the generalizability of the findings and possibly contributed to sample error. Responders may have been more interested in overweight than non-responders, reflecting lower positive attitude and successful management than suggested in the study results. It is important to recognize that survey responses are solely focused on the providers' own perspectives as well as their ability to remember the patient's experiences. Thus, the subjectivity of the self-administered questionnaire and the probability that participants shared the answers with each other are some of the study limitations.

Furthermore, we were unable to accurately assess the demographics of the physicians' patient populations. As the study has been conducted during the COVID-19 pandemic period, this might have affected patient volume, making it difficult to represent the actual numbers of patients encountered. Future studies with larger sample size and objective tools are recommended.

5. CONCLUSION

Bariatric surgery is known to be an effective measure for weight loss in the majority of morbidly obese patients. Overall, male participants demonstrated better practice in the primary care for obese patients. Also, a knowledge gap about the role of bariatric procedures, especially among younger physicians has been identified. The better understanding of this issue, targeting newer practitioners, would lead to improved support services and education for PHCP's caring for obese patients. Additionally, positive attitude toward the management of this problem would influence the rate and pattern of bariatric surgery referrals. This evidence reinforces the importance of focused providers' training on optimizing surgical weight loss encouragement.

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Author contribution

All authors contributed to the design, implementation of the study, analysis of the data, and writing the manuscript.

Ethical approval

The research was reviewed and approved under reference #RC20/325/R from the Institutional Review Board (IRB) of the King Abdullah International Medical Research Center (KAIMRC).

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Conflict of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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