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RESEARCH ARTICLE

Understanding the Bariatric Surgery: Conceptions and Misconceptions in Future Health Care Professionals

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Abstract:

Introduction:

Medically-complicated obesity, a major public health issue due to the ineffectiveness of traditional treatments, is increasingly managed through bariatric surgery. This study investigates the knowledge of clinical year students about bariatric surgery at RAKMHSU. It aims to assess their awareness and understanding of this crucial intervention for severe obesity and its related health risks.

Materials and Methods:

This cross-sectional study was conducted over three months at RAK Medical and Health Sciences University (RAKMHSU) and utilized a survey to assess perception regarding bariatric surgery among clinical year students from RAK College of Medical Sciences (RAKCOMS) and RAK College of Nursing (RAKCONS). A pre-validated questionnaire was employed, and participants were randomly selected. Data analysis focused on the reliability of the tool and the student's perception.

Results:

The study included 197 participants, comprising 162 medical and 35 nursing students. Significant differences emerged in three areas: nursing students preferred daily exercise more (Q6), believed in the greater likelihood of weight regain post-surgery (Q9), and were more aware of disease susceptibility (Q13) compared to medical students. Correlation analysis revealed that students who felt body shape affected self-confidence had better bariatric surgery knowledge and BMI calculation experience. Notable correlations were found between specific questions, with significant positive correlations observed among nursing students but not medical students.

Discussion:

Obesity is a global epidemic with rising prevalence, including in the UAE, where 43% of expatriates are overweight and 32.3% obese. Environmental factors, such as low physical activity due to climate and cultural norms, exacerbate the issue. Our study revealed good knowledge of BMI among participants, reflecting awareness of obesity's risks. However, concerns about bariatric surgery safety persist, with 32% of participants wary of complications. Despite this, the most recognized bariatric surgery is a viable option for medical conditions like PCOS. Educational interventions are essential to address misconceptions, promote informed decisions, and bridge gaps in exercise habits and referral practices.

Conclusion:

In conclusion, while many medical and nursing students demonstrate a solid understanding of bariatric surgery, hesitations and misconceptions persist. Continuous education is essential to address these concerns, enhance knowledge, and align perceptions with clinical advancements. By doing so, future healthcare professionals can make informed decisions and provide better care for patients with severe obesity, ultimately improving outcomes and fostering greater acceptance of evidence-based surgical interventions.

Keywords: Obesity, Bariatric surgery, Education, Medical and nursing students, Health risks, Knowledge assessment.

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1. INTRODUCTION

Obesity has emerged as a significant public health challenge. Annually, it contributes to 2.8 million adult deaths and is linked to 44% of diabetes cases, 23% of ischemic heart disease, and 7–41% of certain cancers [1]. Obesity is largely preventable, with most cases stemming from high energy intake and low physical activity. Only a small fraction is linked to mental illness, medical conditions, or genetics [2 - 4].

The surge in obesity rates in the Arabian Gulf has been linked to rapid cultural and social changes following the oil-driven economic boom of the 1970s and 1980s. A key factor is the shift toward a more "Westernized" diet in both quantity and quality [5 - 8].

In Saudi Arabia, various studies found that processed meals and animal products are increasingly replacing fruits and vegetables [7, 9]. Obesity, defined as a BMI over 30 kg/m^2, causes significant physical changes. Among children and adolescents in developing nations, obesity and overweight rates rose sharply in 2013, from 8.1% to 12.9% in boys and 8.4% to 13.4% in girls [10].

The WHO reports obesity as a global epidemic, with 1.9 billion overweight and 650 million obese adults. In England, 26% of adults and 10% of children were obese in 2016, costing the NHS up to £6.1 billion annually, a figure expected to double by 2050. Public Health England has prioritized addressing obesity and its societal impact [11 - 13].

Obesity also brings social challenges, as individuals with higher weight often face stereotypes, prejudice, and unfair treatment. Despite rising obesity rates, societal weight bias remains largely unchanged, unlike attitudes toward other stigmatized groups, which have improved over time [14, 15].

Up to 40% of adults with obesity report experiencing weight stigma or discrimination, with prevalence increasing alongside BMI. Among those in weight management, over half face weight-related stigma [16 - 18]. Weight stigma stems from stereotypes that individuals with obesity are lazy, unmotivated, lack willpower, and are noncompliant with treatment. This bias is frequently observed in healthcare settings [19, 20].

As a result, there has been a marked increase in the utilization of bariatric surgical procedures as an effective intervention for individuals with extreme obesity, offering a more sustainable solution to managing and reducing excessive body weight and addressing associated health risks [21, 22].

Severe obesity is closely linked to a heightened risk of various comorbidities, including cardiovascular disease, diabetes, and certain cancers, which collectively contribute to increased morbidity and mortality rates. This condition has become a significant healthcare challenge, with its prevalence continuing to rise globally. In response, bariatric surgery has gained recognition as a crucial treatment option due to its proven effectiveness in achieving substantial and sustained weight loss, along with its enhanced safety profile in recent years. Given the growing importance of bariatric surgery in the management of severe obesity, various research works have explored the extent of public awareness and understanding of this surgical intervention, as well as examined the perceived benefits and drawbacks associated with it [23, 24].

Bariatric surgery has gained prominence over the past few decades as a transformative approach to treating severe obesity, offering benefits that extend far beyond mere weight loss. While the primary goal of these surgical procedures is to achieve significant and sustained reductions in body mass, the positive outcomes encompass a broader spectrum of health improvements. Numerous studies have consistently demonstrated that patients who undergo bariatric surgery experience not only substantial weight loss but also a marked reduction in the risk of obesity-related comorbidities, such as type 2 diabetes, hypertension, and cardiovascular disease. Importantly, long-term follow-up research has revealed that the mortality risk among patients treated surgically is significantly lower compared to those who receive conservative, non-surgical treatments. This body of evidence underscores the life-saving potential of bariatric surgery, solidifying its role as a critical intervention in the management of severe obesity and its associated health risks [25 - 27].

Many studies have reported that general practitioners fail to recognize obesity as a chronic disease despite its widespread impact on public health. Compounding this issue, medical education often falls short of adequately covering the treatment of obesity, leaving medical students with limited knowledge on this critical subject. Research has revealed that the understanding of surgical options for treating obesity among general practitioners is alarmingly inadequate, highlighting a significant gap in both medical training and practice that needs urgent attention [28 - 30].

Recent clinical research and the Agency for Healthcare Research and Quality highlight significant improvements in the safety of metabolic and bariatric surgery. Key drivers include advancements in laparoscopy, refined surgical techniques, and certification programs by organizations like the American Society for Metabolic and Bariatric Surgery and the ACS. Laparoscopic procedures rose from 20.1% in 2003 to 90.2% in 2008 [31, 32].

Bariatric surgery helps treat or prevent over 40 obesity-related conditions, including heart disease, type 2 diabetes, GERD, high blood pressure, high cholesterol, sleep apnea, joint issues, and various cancers [33 - 35].

Obesity is a known risk factor for comorbid conditions like cardiovascular disease, type 2 diabetes, cancer, asthma, osteoarthritis, chronic back pain, sleep apnea, non-alcoholic fatty liver disease, and gallbladder issues [36]. While weight loss through a healthy lifestyle is ideal, surgery remains the most effective solution for patients with severe obesity (especially class II and III). Popular bariatric surgeries include Roux-en-Y gastric bypass (RYGB), sleeve gastrectomy (SG), and adjustable gastric banding. Sleeve gastrectomy, particularly laparoscopic sleeve gastrectomy (LSG), has become a safe and effective treatment for obesity and related comorbidities [37 - 40].

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Bariatric surgery significantly reduces overall mortality and the development of new health conditions in morbidly obese patients (BMI ≥35 kg/m^2). One year after surgery, patients lost 23% of their total body weight with sleeve gastrectomy and 31% with Roux-en-Y gastric bypass, with these results maintained over 3 to 10 years [25, 41].

Obesity-related comorbidities improve or resolve in 75% to 90% of patients after bariatric surgery. Type 2 diabetes improves or resolves in over 80% of cases, while hyperlipidemia, hypercholesterolemia, and hypertriglyceridemia improve in more than 70%. Hypertension improves or resolves in over 75%, and obstructive sleep apnea improves or resolves in more than 80% of patients [42 - 45].

Limited experience, knowledge, and education about bariatric surgery are common. In 10 out of 15 cross-sectional studies and 1 out of 3 qualitative studies, it was found that primary care providers with no history of referral were less likely to discuss bariatric surgery, explain procedure options, or provide postoperative care confidently [30, 46 - 55]. Healthcare providers with prior education on obesity management are more likely to counsel patients about bariatric surgery [48, 56].

Based on these facts, this study was conducted to determine the knowledge, attitudes, and perceptions of future healthcare students on bariatric surgery.

1.1. Research Aim

This study determined the level of knowledge of clinical year students in medicine and nursing regarding bariatric surgery.

1.2. Research Objectives

The objectives of this study are as follows:

(1) Assess the overall perception among students regarding bariatric surgery.

(2) Compare the perception of various parameters regarding bariatric surgery among medical and nursing students.

(3) Assess the preferred health interventions among students regarding bariatric surgery.

2. MATERIALS AND METHODS

This study was designed as a cross-sectional survey-based investigation and conducted over three months at RAK Medical and Health Sciences University (RAKMHSU) with due approval of the institute ethics committee (approval number: RAKCOMS-REC-10-2023/24-UG).

2.1. Setting

RAK Medical and Health Sciences University (RAKMHSU) consists of a diverse population that includes students from the third, fourth, and fifth years of the RAK College of Medical Sciences (RAKCOMS) and the RAK College of Nursing (RAKCONS).

2.2. Inclusion Criteria

The study population comprised clinical year students from RAKCOMS and RAKCONS and those who provided consent.

2.3. Exclusion Criteria

Individuals who did not consent to participate and those who were absent during the data collection period were excluded from the study.

Participants were selected through random sampling to ensure a representative and unbiased sample. For data collection, a pre-designed and pre-validated questionnaire was employed. This questionnaire had been specifically developed to assess participants' knowledge regarding bariatric surgery. The questions were assessed for the following: Knowledge: 2,7; Attitude: 4,6,8,9,10,11, and 12; and Practice: 3 and 5 question numbers.

Before its use in the main study, the questionnaire was validated with a separate group of students who were not part of the actual study. This validation process ensured the accuracy and reliability of the questionnaire. To assess the reliability of the questionnaire, Cronbach's alpha was calculated, with a threshold set at 0.7. Only questionnaires achieving a Cronbach's alpha value above 0.7 were deemed reliable for the study; those falling between 0.5 and 0.7 were reviewed for improvement, and those below 0.5 were excluded from the analysis. Each participant's information was given a code number to maintain anonymity, and all the data was password protected.

The study was conducted with a total of 197 participants, consisting of 162 medical students and 35 nursing students. The sample size was determined using G*Power, a statistical power analysis tool. This analysis aimed to achieve sufficient power (typically 0.80 or 80%) to detect meaningful differences between groups with an effect size of 0.5 at a significance level of 0.05. The total sample size of 197 participants was calculated to provide adequate statistical strength for the study's objectives, ensuring reliable and generalizable results.

The collected data was analyzed using SPSS version 29. Descriptive statistics was employed to analyze the demographic data and summarize knowledge levels. Variables were reported as percentages to provide a clear representation of the data collected. There were no missing data; hence, all the data was used to analyze the findings.

3. RESULTS

Upon analysing the responses from both groups, we observed that their opinions remained largely consistent across most aspects of the survey, with no significant differences in the majority of the questions posed. However, notable exceptions were found in three specific questions. In question 6, a higher proportion of nursing students expressed a preference for daily exercise compared to their medical student counterparts. Similarly, in response to question 9, nursing students were more inclined to believe that weight gain would recur even after undergoing weight loss surgery, a sentiment that was less strongly held among medical students. Additionally, question 13 revealed that a greater number of

nursing students agreed with the statement that individuals who lose weight might become more susceptible to other diseases, such as diabetes and hypertension, in contrast to the responses given by medical students, as mentioned in Table **1**.

As mentioned in Tables **2** and **3**, we found that both groups exhibited significant correlations between Q1 and Q3, as well as Q2 and Q3. However, these correlations were stronger in nursing students than in medical students. In particular, the correlations for Q1-Q3 and Q2-Q3 in nursing students were notably strong and statistically significant, while similar correlations in medical students were moderate. No statistically significant correlations were found between Q4 and any other question in either group, indicating that Q4's responses were relatively independent of the other questions in both groups.

Table 1. Values of various parameters for different questions in study groups.

Variables		Medical (162)		Nursing (35)		-
		Mean	**SD**	**Mean**	**SD**	***p*-value**
Age		21.06	1.14	21.40	0.95	0.128
Gender		1.69	0.47	1.83	0.38	0.838
Q1	What is bariatric surgery?	1.36	0.77	1.34	0.91	0.501
Q2	Do you know what a BMI is? Do you know how to calculate your normal BMI?	1.02	0.14	1.06	0.24	0.810
Q3	Do you think your body shape affects your self-confidence?	1.15	0.36	1.17	0.38	0.974
Q4	What is your BMI: underweight, healthy weight, overweight, or obese?	2.21	0.62	2.14	0.55	0.672
Q6	How much exercise do you think is healthy?	**2.80**	**1.31**	**1.71**	**1.15**	**0.006**
Q7	If you know you can reduce your weight through surgery, would you consider it as your choice rather than conservative management of weight loss?	2.04	0.54	1.71	0.62	0.147
Q9	Do you think there will be recurrent weight gain even after going through weight loss surgery?	**1.68**	**0.89**	**1.17**	**0.45**	**0.008**
Q10	How would you rate the safety of undergoing a surgical weight reduction?	1.40	0.53	1.31	0.58	0.422
Q11	Do you believe obesity, when it's exceeded after a point, is hard to reduce and will lead to sagging skin, and therefore, surgery is the better option?	1.35	0.48	1.20	0.41	0.324
Q12	Do you think bariatric surgery is a good option for individuals who find losing weight hard, such as PCOS women, due to their slow metabolism?	1.40	0.49	1.43	0.50	0.109
Q13	If the surgery is performed, do you think the individual becomes susceptible to other diseases, such as diabetes and hypertension?	**1.57**	**0.50**	**1.23**	**0.43**	**0.009**

Table 2. The correlation of different questions among medical students.

Medical Students		Q1	Q2	Q3	Q4
Q1	Pearson Correlation	1	-0.060	**0.331***	0.113
	Sig. (2-tailed)	-	0.684	**0.022**	0.152
Q2	Pearson Correlation	-0.060	1	**0.353***	0.197
	Sig. (2-tailed)	0.684	-	**0.014**	0.179
Q3	Pearson Correlation	0.331*	0.353*	1	-0.031
	Sig. (2-tailed)	0.022	0.014	-	0.836
Q4	Pearson Correlation	0.113	0.197	-0.031	1
	Sig. (2-tailed)	0.152	0.179	0.836	-

Table 3. The correlation of different questions among nursing students.

Nursing Students		Q1	Q2	Q3	Q4
Q1	Pearson Correlation	1	0.319	**0.590****	-0.101
	Sig. (2-tailed)	-	0.062	**<0.001**	0.563
Q2	Pearson Correlation	0.319	1	**0.541****	0.162
	Sig. (2-tailed)	0.062	-	**<0.001**	0.352
Q3	Pearson Correlation	0.590**	0.541**	1	0.020
	Sig. (2-tailed)	<0.001	<0.001	-	0.909
Q4	Pearson Correlation	-0.101	0.162	0.020	1
	Sig. (2-tailed)	0.563	0.352	0.909	-

Table 4. The correlation of different questions among medical students.

Correlations among Medical Students								
-		**Q6**	**Q8**	**Q9**	**Q10**	**Q11**	**Q12**	**Q13**
Q6	Pearson Correlation	1	0.039	0.030	0.048	-0.069	-0.088	0.059
	Sig. (2-tailed)	-	0.622	0.709	0.546	0.384	0.265	0.458
Q8	Pearson Correlation	0.039	1	0.066	-0.107	-0.108	0.074	-0.071
	Sig. (2-tailed)	0.622	-	0.408	0.183	0.176	0.353	0.377
Q9	Pearson Correlation	0.030	0.066	1	0.111	-0.004	-0.020	-0.055
	Sig. (2-tailed)	0.709	0.408	-	0.163	0.962	0.800	0.492
Q10	Pearson Correlation	0.048	-0.107	0.111	1	0.010	-0.102	0.020
	Sig. (2-tailed)	0.546	0.183	0.163	-	0.903	0.199	0.797
Q11	Pearson Correlation	-0.069	-0.108	-0.004	0.010	1	0.067	0.058
	Sig. (2-tailed)	0.384	0.176	0.962	0.903	-	0.397	0.467
Q12	Pearson Correlation	-0.088	0.074	-0.020	-0.102	0.067	1	0.129
	Sig. (2-tailed)	0.265	0.353	0.800	0.199	0.397	-	0.101
Q13	Pearson Correlation	0.059	-0.071	-0.055	0.020	0.058	0.129	1
	Sig. (2-tailed)	0.458	0.377	0.492	0.797	0.467	0.101	-

Table 5. The correlation of different questions among nursing students.

Correlations among Nursing Students								
Nursing students		**Q6**	**Q8**	**Q9**	**Q10**	**Q11**	**Q12**	**Q13**
Q6	Pearson Correlation	1	0.252	0.097	-0.038	0.000	**0.574****	0.077
	Sig. (2-tailed)	-	0.144	0.581	0.830	1.000	**<0.001**	0.660
Q8	Pearson Correlation	0.252	1	0.075	**0.580****	**0.350***	0.121	-0.079
	Sig. (2-tailed)	0.144	-	0.670	**<0.001**	**0.039**	0.488	0.651
Q9	Pearson Correlation	0.097	0.075	1	**0.347***	0.128	0.055	0.248
	Sig. (2-tailed)	0.581	0.670	-	**0.041**	0.464	0.752	0.150
Q10	Pearson Correlation	-0.038	**0.580****	**0.347***	1	0.721**	0.230	0.295
	Sig. (2-tailed)	0.830	**<0.001**	**0.041**	-	<0.001	0.184	0.086
Q11	Pearson Correlation	0.000	0.350*	0.128	**0.721****	1	0.144	0.238
	Sig. (2-tailed)	1.000	0.039	0.464	**<0.001**	-	0.408	0.168
Q12	Pearson Correlation	**0.574****	0.121	0.055	0.230	0.144	1	**0.354***
	Sig. (2-tailed)	**<0.001**	0.488	0.752	0.184	0.408	-	**0.037**
Q13	Pearson Correlation	0.077	-0.079	0.248	0.295	0.238	**0.354***	1
	Sig. (2-tailed)	0.660	0.651	0.150	0.086	0.168	**0.037**	-

Note: **Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Among medical students, question 6 was negatively correlated with answers to question 12 but was not significant, but in the case of nursing students, there was a positive significant correlation observed. This was also seen with question 8 correlating with questions 10 and 11, as presented in Tables **4** and **5**. Apart from this, questions 9, 11, and 12 had a significant positive correlation with 10, 10, and 13, respectively, in nursing students but were non-significant in medical students, as presented in Tables **4** and **5**.

The bar Fig. (**1**) shows the percentage of participants who agreed with various statements about bariatric surgery. The results are as follows: 60% agreed that bariatric surgery is a weight loss procedure by reducing the stomach size, 65% believed body shape affects self-confidence, 53% felt surgery is not their choice for weight reduction, 54% saw it as the best option for morbid obesity, and 50% acknowledged the risks involved in the procedure.

Q7: Do you think obesity can cause or contribute to health problems, such as diabetes, hypertension, pregnancy complications, or mental health issues like depression or anxiety?".

Fig. (**2**) shows the comparison of views of medical and nursing students about question 7. It showed a majority of nursing students agreed that being obese is a reason for having diabetes. A significant portion of medical students chose the option of depression/anxiety, while no nursing students selected this option.

Fig. (**3**) shows the comparison of different questions. It showed a majority of nursing students agreed yes to different questions when compared to medical students.

Q11: Do you believe obesity, when it is exceeded after a point, is hard to reduce and will lead to sagging skin, and therefore, surgery is the better option?

Q12: Do you think bariatric surgery is a good option for individuals who find losing weight hard, such as PCOS women, due to their slow metabolism?

Q13: If the surgery is performed, do you think the individual becomes susceptible to other diseases, such as diabetes and hypertension?

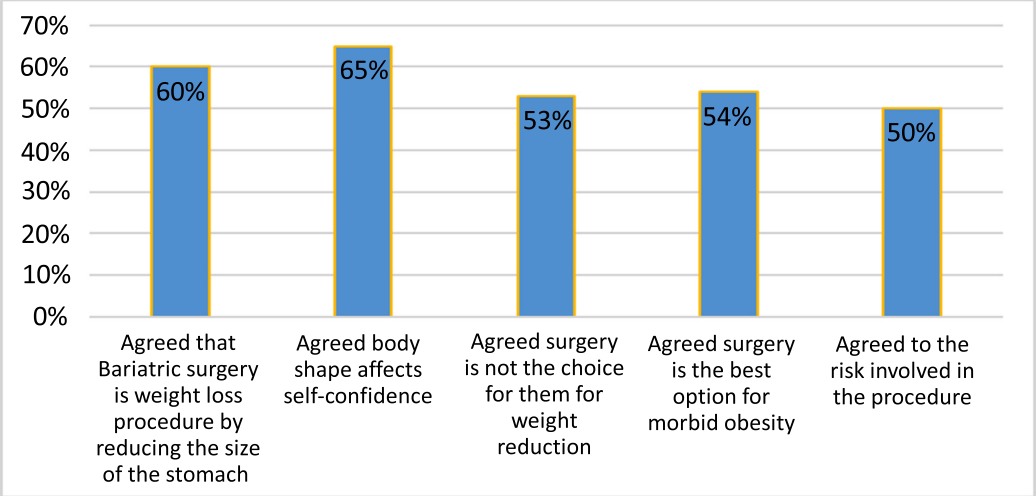

Fig. (1). Overall perception of students regarding bariatric surgery.

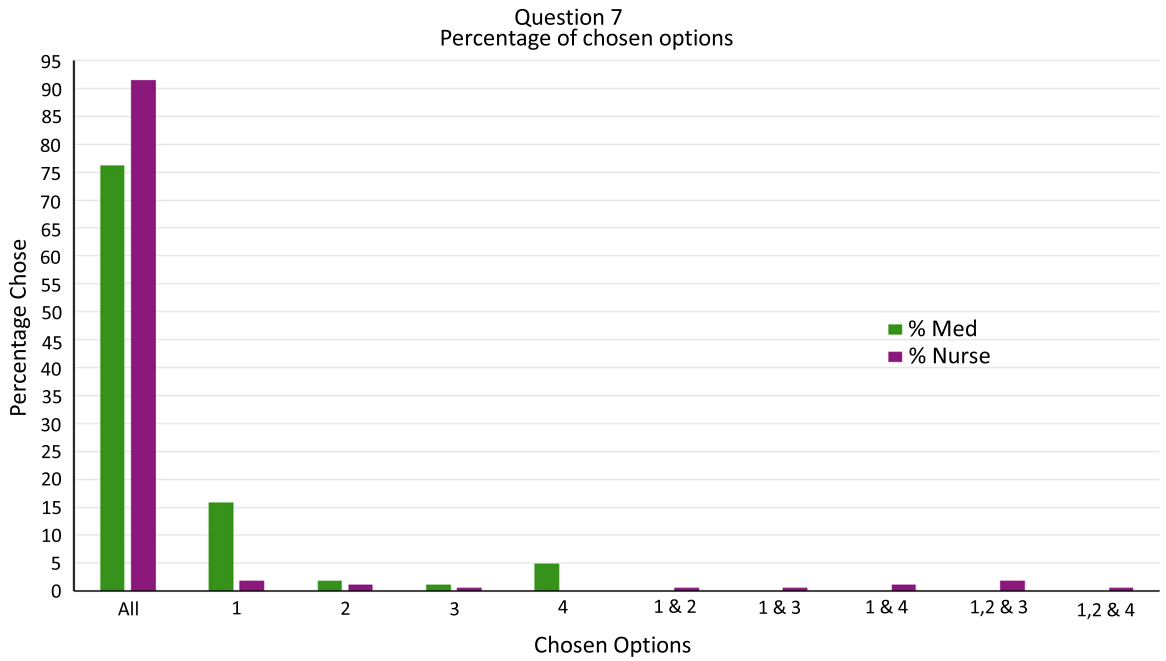

Fig. (2). Frequency bar graph for Q7 showing the results between MBBS and nursing students.

Table 6. Preferred health interventions among medical and nursing students.

Health Interventions	Medical (%)	Nursing (%)
Dietary change	39.6	79.9
Exercise	33.5	7.9
Medication	1.2	4.9
Surgery	4.9	.6
Combination	19.5	6.7

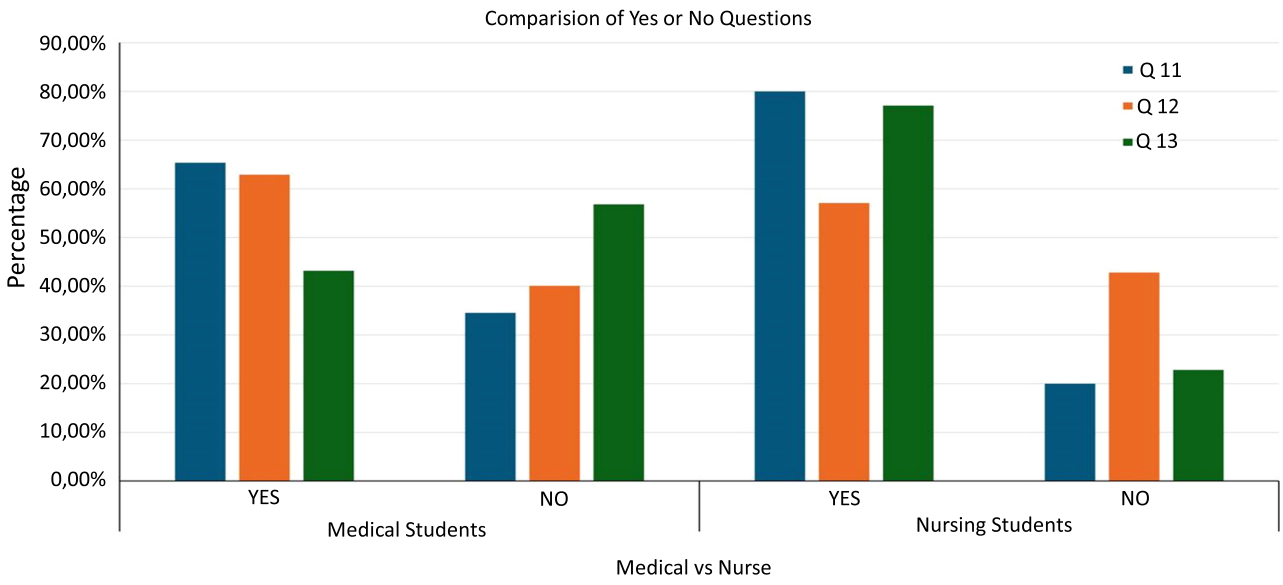

Fig. (3). Frequency bar graph showing the comparison of close-ended questions between medical and nursing students.

As mentioned in Table **6**, a larger proportion of nursing students (79.9%) reported making dietary changes, compared to 39.6% of medical students. Conversely, medical students were more likely to engage in exercise, with 33.5% reporting this behavior, while only 7.9% of nursing students did so. Medical students were more likely to use a combination of interventions, with 19.5% reporting multiple approaches, compared to 6.7% of nursing students.

4. DISCUSSION

Obesity has become a global epidemic. Surgical treatment of obesity and metabolic disorders in the world is increasing rapidly [57]. A 2013 study found that a significant proportion of expatriate residents in the UAE were classified as overweight (43.0%) or obese (32.3%) based on BMI. Additionally, a considerable percentage were at a substantially increased risk of metabolic complications, as indicated by elevated waist circumference (52.4%) and waist-to-hip ratio (56.5%) [58].

The high prevalence of overweight, obesity, and metabolic conditions among expatriates in the UAE can be attributed to multiple factors. A lack of a strong physical activity culture in the Gulf States, potentially influenced by the hot climate, plays a significant role. Women, in particular, have notably low physical activity levels due to social norms and limited access to facilities, contributing to their higher obesity rates. Additional factors include a high prevalence of smoking, emotional stress, and the widespread use of domestic helpers, which may reduce physical exertion. Collectively, these elements create an environment conducive to weight gain and related health issues [59 - 61].

In our study, both groups had good knowledge about BMI, and they were aware of how to calculate it. This shows that they know obesity is a concern and how to handle it and educate others in the community. The study also uncovered notable concerns among the population regarding bariatric surgery. Approximately 32% of participants voiced apprehensions about the safety of these procedures, reflecting a widespread unease. This was also reflected in our study as overall 50% of participants opined that risks are major concerns. Additionally, 31% of participants believed that the high complication rates associated with bariatric surgery rendered it unsafe.

These findings underscore the need for targeted educational efforts to address misconceptions and enhance understanding of the benefits and risks of bariatric surgery [62]. This behavior is also seen in hospital settings, as studies have reported that a major barrier to referring patients for bariatric surgery (BS) is the concern about postoperative complications [63 - 65]. Perlman *et al*. identified the primary reason for avoiding referrals as the perception that BS carries a high risk of complications and mortality [50].

In our study, even the risk involved, the majority, around 62% of medical and 55% of nursing students, suggested bariatric surgery is a choice when a person is unable to lose weight due to medical conditions, such as PCOS due to their slow metabolism. Is this surgery needed in normal obese individuals is a point of concern, and an appropriate education is required for future health professions? This question needed to be addressed as studies have shown that the primary reason for non-referral to bariatric surgery (BS) was a lack of interest among certain specialists (37.3%). Orthopedics showed the highest disinterest (67.6%), followed by endocrinologists (60.0%), gastroenterologists (55.6%), pulmonologists (38.7%), gynecologists (37.5%), physicians (35.0%), and cardiologists (34.1%). These findings suggest that limited knowledge about BS significantly hinders its adoption [66].

In our study, we asked about the BMI status, and the majority of medical students were either healthy or overweight, and in nursing, the majority of the students were healthy. However, it was also found that nursing students preferred daily exercise, whereas the majority of medical students

preferred once or twice a week exercise. This may be due to academic pressure executed in different courses. This suggests the gap between maintaining a healthy weight and the adoption of regular exercise habits, which are key to losing weight. This attitude would be reflected in their future practice as reported by studies on general practitioners' (GPs) knowledge and attitudes toward bariatric surgery (BS). However, few primary care providers reported referring eligible patients for bariatric consultations. Instead, GPs predominantly recommended non-surgical approaches, such as dietary interventions, increased physical activity, and behavioral therapy, viewing these as more effective options [47, 51, 53, 63, 67 - 70].

A study aimed to evaluate the understanding of bariatric surgery among Saudi medical students and recent graduates. The findings were promising; 73% of the participants demonstrated a clear understanding of the appropriate indications for bariatric surgery, indicating a solid grasp of when the procedure is clinically warranted.

However, it also highlights the importance of continued education and training to ensure that all healthcare professionals are well-informed and confident in advising patients on this critical intervention for severe obesity [71].

A study conducted on nurses found that only 38.7% had habits of regular physical exercise. Most nurses (99%) agreed that physical exercise is effective in weight loss. In our study, nursing (79.9%) preferred more dietary intervention when compared to medical students, who had a preference for dietary and exercise. A higher number of medical students (19.5%) also preferred a combination of activities and interventions to lose weight compared to 6.5% of nursing students.

The importance of educating the nurses is crucial as studies have reported that some nurses may not adhere to recommended guidelines for nutrition and exercise, with factors, such as gender and age potentially influencing these behaviours [72]. In Sweden, approximately 50% of nurses infrequently calculated their BMI, and nearly one-third reported rarely engaging in regular exercise or maintaining a healthy diet [73]. Various studies reported that most nurses still believed the modalities of weight loss to be limited to exercise and diet, which was also found in our study as a majority in medical and nursing opined the same [71 - 75].

This study focused on the education of future healthcare students, which is essential for their practice, as studies have reported that the lack of knowledge and skills in diagnosing obesity among some doctors and nurses was due to the absence of clear guidelines on obesity and lifestyle. In response, Geneva revised the undergraduate and postgraduate curricula for medical students, doctors, and healthcare providers [76]. This highlights the need to enhance knowledge and communication skills regarding obesity [77, 78]. Nurses, in particular, should be proficient in using key indicators like BMI, waist circumference, and hip circumference to assess obesity, as the World Obesity Federation has stated that "obesity is a chronic relapsing disease process" [79]. Professional associations focused on obesity and metabolic diseases have been established, and bariatric surgery is increasingly included in medical school curricula and student textbooks [80].

Our study did not assess the knowledge of bariatric procedures like sleeve gastrectomy, Roux-en-Y gastric bypass, and biliopancreatic diversion with duodenal switch [81]. However, studies have reported that among the methods of weight loss, it is now widely accepted that the surgical approach results in superior weight loss outcomes compared to non-invasive weight loss measures [82, 83]. The surgical procedures are not devoid of complications, which was found to be a major concern of students in our study. Few studies also reported the major complications in sleeve gastrectomy, such as leakage, which is the most frequent postoperative complication of SG [84 - 88], the occurrence of chronic dehydration in bariatric patients, with narrower gastric pouches [89], stapler misfiring [90], postoperative nausea and vomiting, reduced food intake, nutritional deficiencies, *etc* [91].

CONCLUSION

In conclusion, this study assessed the understanding of bariatric surgery among medical and nursing students. Although many exhibited a solid grasp of the procedure, some hesitated due to misconceptions. Continuous education is essential to address these gaps and align knowledge with clinical advancements, ultimately improving patient care for those with severe obesity, which often reflects underlying metabolic disorders rather than being a standalone disease.

LIMITATION

The study was conducted in a single setting, hence minimizing the generalisability.

AUTHORS' CONTRIBUTION

It is hereby acknowledged that all authors have accepted responsibility for the manuscript's content and consented to its submission. They have meticulously reviewed all results and unanimously approved the final version of the manuscript.

LIST OF ABBREVIATIONS

ACS	=	Acute Coronary Syndrome
RYGB	=	Roux-en-Y gastric bypass
SG	=	Sleeve gastrectomy
LSG	=	Laparoscopic Sleeve Gastrectomy

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the institute ethics committee (RAK Medical and Health Sciences University (RAKMHSU) with an approval number: RAKCOMS-REC-10-2023/24-UG), United Arab Emirates.

HUMAN AND ANIMAL RIGHTS

All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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