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RESEARCH ARTICLE

FACTORS AFFECTING THE PREFERENCE OF POPULATION IN LOSING WEIGHT BY EITHER BARIATRIC SURGERIES OR CONSERVATIVE STRATEGIES IN SAUDI ARABIA

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Abstract

Objectives: To assess factors affecting Saudi population preference in losing weight either by bariatric surgeries or by conservative strategies.

Methods: A cross sectional study was done using a self-administered questionnaire distributed online. Study was done on 518 participants (group 1) who did not prefer to undergo bariatric surgery and preferred conservative strategies in weight reduction and group 2 (84 participants) who preferred to undergo bariatric surgery.

Results: Participants in group 1 and group 2 represented 86% and 14% of the sample. Group II had a significant higher percent of obese and per-obese individuals, who usually eat basic meals every day, who usually have soft drinks as beverages, who eat fast food for more than 2 times weekly, who had more than 6 attempts to lose weight in the last 5 years and who thought that their families would support their efforts in improving their food habits. Group II had a statistically significant higher percent of those who consider bariatric surgery as an effective tool for weight loss, who believed that they would lose more weight with bariatric surgery, and who believe that surgery will cause a drastic change in their lifestyle. Group 1 had a significant higher percent of those who eat fruit and vegetables every day, who reported always practicing physical activity during the entire year.

Conclusion: Factors affecting the preference of weight loss were eating habits, physical activity, and attempt of dieting. An efficient health education programs about bariatric surgeries is needed to correct misconceptions regarding the surgery.

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Introduction:-

Obesity is characterized by a gradual increase in body fat [1]. Obesity is caused by an imbalance of calories spent and calories consumed [2]. Patients with polycystic ovarian syndrome, hypothyroidism, hereditary syndromes (e.g., Alstrom, Prader-Willi, and Bardet-Biedl syndromes), eating disorders, a family history of obesity, and patients who stopped smoking are more likely to become obese [3]. Obese people have a higher risk of developing conditions such as type 2 diabetes, hypertension, heart disease, cancer, obesity-related glomerulopathy, dyslipidemia, and

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psychological issues[3]. Adults who have struggled to lose weight by therapy and diet should seek bariatric surgery[4]. The criteria for bariatric surgery indication is patients with body mass index (BMI) of 35-40, associated co-morbid conditions, and all patients with BMI (kg/m^2) of >40 [5]. Sleeve gastrectomy, laparoscopic adjustable gastric banding, and gastric bypass are all examples of bariatric surgery[6].

Obesity has become a common public health issue in the Kingdom of Saudi Arabia (KSA), and it is affecting all adults [3]. In KSA, more than 60% of the population are obese, and studies have revealed that obesity prevalence is higher among females [3, 7]. A survey was conducted in 2019 to determine the general public's knowledge of bariatric surgery complications. The abovementioned study discovered that two-thirds of the people polled were aware of the risks of bariatric surgery. The participants who had previously undergone weight loss surgery were more conscious [8]. Another survey conducted in 2019 to determine public understanding of bariatric surgery determined that 22.7% of the participants were unaware of the procedure, 18.9% thought that it was a cosmetic procedure, and 50% were unaware of its criteria [9].

As published studies in Saudi Arabia about factors affecting the preference of population in losing weight either by bariatric surgeries or conservative strategies are scarce, the aim of this study was to assess these factors which affecting the preferences.

Subjects and Methods:-

This study was a cross-sectional study; it was performed during the period of January to March 2020. The study was conducted on adult male and female population who lived in different regions of KSA. The participants agreed to answer the questionnaire to assess the effect of different characteristics of the respondents on their preference of losing weight by either bariatric surgeries or conservative strategies.

The data were gathered using a self-administered questionnaire that was circulated through social media (i.e., WhatsApp, Twitter, and Facebook). The questionnaire requested information on the following topics: 1) characteristics of socio-economic status (i.e., age, gender, nationality, marital status, education level, income, and region) and clinical characteristics of the respondents (i.e., body mass index and chronic diseases). 2) Food habits, lifestyle (physical activity), and dieting attempts by the respondents. 3) Awareness of bariatric surgery. The participants were divided into two groups. The participants in group I favored traditional techniques (e.g., dietary change, medicine, or other approaches) over bariatric surgery. Whereas the participants in group II preferred bariatric surgery.

Statistical analysis: For data processing, IBM SPSS version 20 (IBM Corporation, Armonk, NY, USA) was used. The participants' information was provided in the form of numbers and percentages. The chi-square (2) test was used to assess the correlations between various characteristics of the respondents and their preferred methods of losing weight, and the analysis was deemed statistically significant at the p-value of 0.05.

Compliance with ethical requirements

The research protocol was accepted by Taif University research ethics committee. Participants' anonymity was maintained by omitting their names and any other information that could be used to identify them.

Results:-

In this study, a total of 603 participants responded and completed the survey. Most of the respondents were females (59.5%); 526 (87.4%) respondents were Saudis; 47.0% of the respondents were 18–24 years old, and 56.8% were unmarried. Most of the participants had higher education (74.8%). The percentages of our participants from different regions were similar.

There was a total of 518 (86%) participants in group I, and 84 (14%) in group II. In group I, 390 (75.3%) participants preferred to lose weight by conservative strategies because those approaches were deemed healthier; 71 (13.7%) participants mentioned that conservative strategies were safer than surgery; 46 (8.9%) mentioned that they were afraid of complications, and 11 (2.1%) mentioned that conservative strategies were cheaper than surgery. In group II, 41 (48.8%) participants preferred to lose weight by surgery because it was faster than conservative strategies; 32 (38.1%) reported that it was the only solution, and 11 (13.1%) reported that it was easier than conservative strategies (Table1).

Table 2 shows that there was no statistically significant association between the preference of bariatric surgery and age, nationality, marital status, sex, education level, and income of the participants. In contrast, there was regional variation with respect to the preference of bariatric surgery with a statistically significant association ($p = 0.032$), where the highest preference for group II (34.5%) was in the western region, and the highest preference (25.9%) for group I was in the eastern region.

Table 3 shows that for group I, 221 (42.7%) participants had normal weight, 138 (26.7%) were pre-obese, 121 (23.3%) were obese, and 38 (7.33%) were underweight. For group II, 58.3% were obese, 34.5% were pre-obese, 7.2% were normal, and none of the participants were underweight; there was a statistically significant difference between the two groups ($p = 0.0001$). No statistically significant difference was observed between the two groups according to the presence of chronic disease ($p \geq 0.05$). Out of all participants, 34.9% of group I and 37.6% of group II wanted to lose less than 50% of their excess weight; 54.6% of group I and 57% of group II wanted to lose 50–100% of their excess weight, and 6.8% of group I and 19% of group II wanted to lose more than 100% of their excess weight without any significant difference between the two groups. Table 4 shows that compared to group I, group II has a significant higher percent of the participants who usually eat breakfast, lunch, and dinner every day, have soft drinks as beverages between meals, and eat fast food more than 2 times per week. Group 1 has a significantly higher percent of those who eat fruit and vegetables everyday compared to group II. In contrast, a non-significant difference was observed between the two groups according to nutrients in the diet of the participants, healthiest cooking method, and healthiness of the diet.

Group I had a statistically significantly higher percent of the participants who reported to always engage in physical activity throughout the year (19% vs. 7%). While group II had a significantly higher percent of the participants who had more than 6 attempts of losing weight in the last 5 years (59.5% vs. 16.4%) and who thought that their families would support their efforts in improving their food habits (78.6% vs. 26.4%) ($p \leq 0.05$). A non-significant difference was observed between the two groups according to hours of practice, what they preferred to do during free time, and their lifestyle ($p \geq 0.05$) (Table 5). Table 6 shows that group II has a statistically significantly higher percent of the participants who consider bariatric surgery as an effective approach for weight loss (100% vs. 51.7%), who believe that they will lose more weight with bariatric surgery (95.2% vs. 57.5%), and who believe that surgery will cause a drastic change in their lifestyle (81% vs. 58.3%) ($p \leq 0.05$).

Discussion:-

According to WHO, obesity is prevalent in 35.4% of Saudi Arabians, which indicates inefficiency or lack of preventive measures [10,11]. However, there is a lack of knowledge in Saudi Arabia about factors that affect people's favorite weight loss methods. As a result, we conducted this study among Saudi Arabia's adult population to determine factors that affect whether people choose to lose weight through bariatric surgery or through more conservative methods.

A total of 602 people participated in the survey, with 86% preferring to lose weight through lifestyle changes (conservative management); 75.3% favor the conservative approach because it is better; 8% favor the conservative approach because they are afraid of surgical risks, and only 14% prefer bariatric surgery to lose weight. Another research conducted in Saudi Arabia showed a similar result, with 87.5% of the participants not considering surgery as a first resort for weight loss without diet or exercise [12]. Another survey determined that the majority of people (77.6%) thought that bariatric surgery was not the right way to lose weight [13]. A separate study included 151 patients, with 50 opting for conservative treatment, and 101 opting for bariatric surgery [14]. Participants in previous studies who chose surgical treatment wanted to boost their self-esteem, and many were concerned about losing control of their weight [15, 16].

There was no statistically significant link between bariatric surgery preference and age, nationality, marital status, sex, education level, or income in this sample. Two experiments conducted in Saudi Arabia yielded similar results [17, 18]. Another study was performed in Pennsylvania [19]. Approximately 56% of our participants had BMI that was higher than average (pre-obese: 27.7%; obese: 28.2%). With a statistically significant difference between the two groups, 92.8% of them tended to lose weight by surgery. This result confirms a previous study conducted in Pennsylvania, which observed that there were substantial differences in BMI between the two groups, with those who chose surgery usually being heavier than those who chose weight loss by conservative measures [19]. In addition, conservative approach patients were observed to have a slightly lower BMI in other trials [20,21]. Obese

people were observed to prefer bariatric surgery over other options (e.g., diet and exercise) because it was a quicker and simpler way to lose weight.

The majority of participants in this study did not have any chronic diseases (e.g., asthma, diabetes, and sleep apnea). In comparison, recent studies have shown that obesity-related comorbidities (e.g., type 2 diabetes and obstructive sleep apnea) can be strengthened or reversed after bariatric surgery [21, 22]. The results of this study may differ because the majority of the sample size had a younger age.

This study showed a statistically significant difference between the two groups on eating fruits and vegetables (p -value = 0.0001) because participants in group I reported eating fruits and vegetables every day, while only 23 (27%) participants in group II reported that. This result is consistent with the results in previous studies [7, 8]. Another study observed that obese patients seeking bariatric surgery lost control over their intake of high-fat, high-sugar, and/or high-salt foods but not fruits, vegetables, or grain products [23].

Regarding fast food consumption, more than one-half of the participants from group II eat fast food more than 2 times per week. In a previous study, fast food consumption has been linked to higher BMI, weight gain, and difficulty sustaining weight loss [2]. In this study, 56% of the participants in group I drink mineral water between meals, while 65.5% of group II do not, and 62% of group II eat breakfast, lunch, and dinner every day. According to the results of another study, the majority of patients (92.1%) reported eating dinner on a regular basis; although slightly over half (54.0%) of the participants reported eating breakfast on a regular basis prior to bariatric surgery [13].

In this survey, the majority of group II participants stated that they tried at least 6 times to lose weight in the previous 5 years. A similar result was obtained in a study performed in Al-Madinah, which determined that the majority of respondents sought conventional approaches to lose weight (dieting)[24]. In our view, more people attempt to lose weight by conservative approaches and fail, which affects their ability to choose.

This study showed that group I had a statistically significantly higher percent of the participants who thought that their families would support their efforts in improving their food habits. According to previous studies, the frequency and importance of family meals are linked to the family's perceived support, especially in terms of intangible resources as well as overall happiness with life and food [25]. Family social engagement has been shown to be an important factor in promoting and sustaining positive healthy behavior changes [26]. Family is a source of behavior change, especially when it comes to maintaining an attainable target weight and engaging in regular physical activity [26]. Almost one third of group II participants never engaged in any physical activity. Previous studies have shown that candidates for bariatric surgery have low levels of physical activity. Candidates for surgery showed a slightly lower activity counts per hour and spent fewer minutes per day doing physical activity than the controls [27]. This study showed that all participant in group II considered bariatric surgery as an effective approach for weight loss. A similar result was obtained in Al-Madinah, which showed that the majority of people thought that bariatric surgery was a successful way to lose weight [13]. According to a study conducted in Riyadh, 79% of the participants claimed that bariatric surgery was a successful method for weight loss [28]. Other studies contradicted this result and indicated that surgery was not a good way to lose weight [18].

The majority of group II participants assumed that surgery would result in a significant improvement in their lifestyle. This is supported by a previous study [29]. Patients' everyday life experiences and social lives significantly changed 5 years after the gastric bypass surgery, and they were mostly happy with their lives.

Table 1:- Causes of preferring losing weight by conservative strategies or by surgery.

	TotalN= 602	Causes	N (%)
Group I	518(86%)	Healthier	390 (75.3%)
		saver than surgery	71 (13.7%)
		Cheaper	11 (2.1%)
		Fear of complication	46 (8.9%)
Group II	84(14%)	Faster	41 (48.8%)
		Easier	11 (13.1%)
		It is the only solution	32 (38.1%)

Table 2: - Socio-demographic characteristics of the respondents in the two studied groups.

Parameter		Total N = 602	Group I N = 518	Group II N = 84	χ^2	P value
Age	18-24	283	242 (46.7%)	41 (85.4%)	2.314 ^a	0.510
	25-34	167	149 (28.7%)	18 (21.4%)		
	35-49	124	104 (20.0 %)	20 (23.8%)		
	>50	28	23 (4.44%)	5 (5.9%)		
Nationality	Saudi	526	450 (86.8%)	76 (90.4%)	0.0851 ^a	0.356
	Not Saudi	76	68(13.1%)	8 (9.5%)		
Marital status	Unmarried	342	295 (56.9%)	47(56%)	0.029 ^a	0.864
	Married	260	223 (43.0%)	37(44%)		
Sex	Male	244	209 (40.3%)	35(41.6%)	0.052 ^a	0.819
	Female	358	309 (59.6%)	49 (58.3%)		
Education level	Illiteracy	3	2 (0.38%)	1 (1.1%)	1.519 ^a	0.678
	1ry school / Intermediate	16	13 (2.5%)	3 (3.5%)		
	High school	133	113 (21.8%)	20 (23.8%)		
	University and above	450	390 (75.2%)	60 (71.4%)		
Income	Less than 1500	239	209 (40.3%)	30 (35.7%)	0.850 ^a	0.837
	1500-5000	111	94 (18.1%)	17 (20.2%)		
	5000-10000	108	91 (17.5%)	17 (20.2%)		
	More than 10000	144	124 (23.9%)	20 (23.8 %)		
Region (area)	Western	138	109 (21.0%)	29 (34.5%)	10.557 ^a	0.032
	Eastern	143	130 (25.9%)	13 (15.4%)		
	Central	109	98 (18.9%)	11 (13.0%)		
	Southern	102	89 (17.1%)	13 (15.4%)		
	Northern	110	92 (17.7%)	18 (21.4%)		

Table 3:- Clinical characteristics of the respondents in the two studied groups.

Parameter		TotalN = 602	Group IN = 518	Group IIN = 84	χ^2	P value
BMI categories	Underweight	38	38 (7.33%)	0 (0%)	44.229 ^a	0.0001
	Normal	227	221 (42.7%)	6 (7.2%)		
	Pre-obesity	167	138 (26.7%)	29 (34.5%)		
	Obese	170	121 (23.3%)	49 (58.3%)		
Chronic diseases	No	509	442 (85.3%)	67 (79.7%)	7.225 ^a	0.406
	Asthma	20	18 (3%)	2 (2.3%)		
	Arthritis	10	8 (1.5%)	2 (2.3%)		
	Diabetes	20	15 (2.8%)	5 (5.9%)		
	Heart disease	8	8 (1.5%)	0 (0%)		
	Hypertension	18	14 (2.7%)	4 (4.7%)		
	Sleep apnea	11	9 (1.7%)	2 (2.3%)		
	Gall disease	6	4 (0.9%)	2 (2.3%)		

Table 4:- Food Habits Characteristics of the respondents in the two studied groups.

Parameter		Total (602)	Group I N = 518	Group II N = 84	χ^2	P value
Do you usually eat breakfast, lunch and dinner every day?	Yes	299	247 (47.7%)	52 (62%)	5.848 ^a	0.015
	No	303	271 (52.3%)	32 (38%)		
How times do you eat fast food in 1 week?	Never	225	225 (43.4%)	0 (0%)	5.504 ^a	0.0001
	1-2	260	231 (44.6%)	29 (34.5%)		
	More than 2 times	117	62 (12%)	55 (65.5%)		
Which beverages do you usually drink between	mineral water	296	290 (56%)	6 (7.14%)	2.705 ^a	0.0001
	Soft drinks	119	64 (12.3%)	55 (65.5%)		

meals?	fruit juice/ milk shakes	187	164 (31.7%)	23 (27.4%)		
Your diet is based mainly on	high protein	133	115 (22.2%)	18 (21.4%)	2.015 ^a	0.569
	high fat	294	256 (49.4 %)	38 (45.3%)		
	high carbohydrate	143	122 (23.6%)	21 (25%)		
	different foods every day	32	25 (4.8%)	7 (8.3%)		
According to you, which is the healthiest cooking method	on a grill/ in boiled water	188	162(31.2%)	26(31%)	2.129 ^a	0.546
	frying/ braising	29	23(4.4%)	6(7%)		
	in the oven without fats	335	292(56.4%)	43(51%)		
	in a pan with fats	50	41(8%)	9(11%)		
According to you, which is a healthy diet?	rich in different foods	393	346 (66.8%)	47 (56%)	7.768a	0.140
	rich in protein	102	85 (16.4%)	17 (20.1%)		
	without any fats	107	87 (16.8%)	20 (23.9%)		
Do you eat fruit and vegetables everyday	Yes	337	314 (61%)	23 (27%)	4.432a	0.0001
	No	265	204 (39%)	61 (73%)		

Table 5:- life style (physical activity) character of the respondents.

Parameter		Total (602)	Group I N = 518	Group II N = 84	χ^2	P value
Do you usually practice a physical activity?	Always during entire year	104	98 (19%)	6 (7%)	10.067 ^a	0.018
	Only in some season	80	67 (13%)	13 (16%)		
	Sometimes	334	287 (55%)	47 (56%)		
	Never	84	66 (13 %)	18 (21%)		
How many hours do you practice it?	no hour	84	66 (13 %)	18 (21%)	6.749 ^a	0.126
	1–2h in a week	330	284(54.8%)	46(54.76%)		
	3–4h in a week	97	86 (16.6%)	11 (13%)		
	> 4 h in a week	91	82 (15.8%)	9 (10.7%)		
What do you prefer to do during free time?	Walking	44	37 (7.1%)	7 (8.3%)	12.517 ^a	0.061
	Watching TV	169	146 (28.2%)	23 (27.4%)		
	Listening to music	65	49 (9.5%)	16 (19.1%)		
	Using the computer	110	96 (18.5%)	14 (16.7%)		
	Reading a book	63	60 (11.6%)	3 (3.6%)		
	practicing a sport	30	28 (5.4%)	2 (2.4%)		
	Shopping	121	102 (19.7%)	19 (22.6%)		
Your lifestyle is?	Sedentary	257	215 (41.5%)	42 (50%)	2.49 ^a	0.322
	Moderately active	315	276 (53.3%)	39 (46.4%)		
	Very active	30	27 (5.2%)	3 (3.6%)		
How many attempts at dieting in the last five years?	None	237	218 (42.1%)	19 (22.6%)	11.71a	0.0001
	1-5	230	215 (41.5%)	15 (17.9%)		
	≥ 6	135	85 (16.4%)	50 (59.5%)		
Do you think that your family would support your efforts in improving your food habits	yes	399	381 (73.6%)	18 (21.4%)	12.37 ^a	0.0001
	no	203	137 (26.4%)	66 (78.6%)		

Table 6:- Attitude of participants towards bariatric surgery.

Parameter		Total N = 602	Group I N = 518	Group II N = 84	χ^2	P value
Do you consider bariatric surgery as an effective tool for weight loss?	Yes	353	269 (51.9%)	84 (100%)	33.591 ^a	0.0001
	No	249	249 (48.1%)	0 (0%)		
Do believed that you would lose more weight with bariatric surgery?	Yes	378	298 (57.5%)	80 (95.2%)	18.401 ^a	0.0001
	No	224	220 (42.5%)	4 (4.8%)		
Do you believe that surgery will cause a drastic change in your Lifestyle?	Yes	370	302 (58.3%)	68 (81%)	15.657 ^a	0.0001
	No	232	216 (41.7%)	16 (19%)		

Limitation:-

The fact that the questionnaire was distributed through social media and those participants estimated their height and weight was a limitation of this study. As a result, there could be a shortage of correct height and weight measurements.

Conclusion:-

In summary, the aim of this study was to identify factors that affected people's weight loss preferences in Saudi Arabia, i.e., whether they preferred to use bariatric surgery or more traditional methods. Traditional weight loss approaches were preferred by the majority of our participants over bariatric surgery. In contrast, higher BMI participants were more likely to undergo surgery. Serious illnesses, eating habits, physical activity, and dieting attempts are important factors that affect weight loss plan choice.

Recommendations:-

The study recommends that credible sources of knowledge about bariatric surgery be made available to the public. To correct misconceptions about bariatric surgery, effective health education campaigns about obesity and bariatric surgeries should be implemented.

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Conflicts of interest

There are no conflicts of interest.

Ethical approval

Registered at Taif university research Ethical committee between SEP 2020 to SEP 2021 (Application number 42-0007)

Authors Contribution

All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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