IJMRP

Original Research Article.

The Impact of a Weight Loss Program on Quality of Life in Obese Adult Patients at King Fahad Hospital, Jeddah, 2017

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ABSTRACT

Background: Obese patients have lower health-related quality of life (QoL) scores than the general population. Weight loss is associated with improvements in various quality of life domains. The relationship between weight loss after dietary changes and QoL remains unclear.

Objective: To assess QoL in adult (aged more than 18 years) obese patients who participated in a weight reduction program at King Fahad General Hospital in Jeddah in 2017.

Methodology: A quasi-experimental study was performed using 90 adult obese patients. To asses QoL and take anthropometric measurements in participants that met inclusion criteria, the Short Form 36 was completed before and 3 months after the weight reduction program. The paired Student t test was used to find differences between groups.

Results: The response rate was 85.5% (77 of 90) in the weight reduction program group. The weight reduction program improved most of the domains in the Short Form 36. Global QoL significantly (p < 0.05) increased from 55.3 ± 16.1 (mean ± standard deviation) to 64.0 ± 19.1.

Conclusion: The weight reduction program is associated with improvement in most QoL domains but mostly in role limitations in physical and emotional health.

Keywords: Quality of life, Obesity, Adult, Weight reduction program, Short Form-36.

Abbreviations:
BMI: Body mass index; **KSA:** Kingdom of Saudi Arabia; **US:** United States; **QoL:** Quality of life; **HRQoL:** Health-related quality of life; **SF-36:** Short Form 36; **RAND:** Research and Development corporation.

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Access this article online	
Website: www.ijmrp.com	**Quick Response code**
DOI: 10.21276/ijmrp.2018.4.1.087	

INTRODUCTION

Obesity is the accumulation of abnormal or excessive fat in the body, and body mass index (BMI) is the diagnostic tool used to identify obesity and its degree of severity.[1] When BMI is at least 30, the person is considered to be obese, and when BMI is at least 25, the person is considered to be overweight.[1] In several developing societies, the western lifestyle is characterized by low physical activity and high caloric intake, which have led to the shift in causes of death from communicable to non-communicable bases.[2] The prevalence of obesity is increasing worldwide: 39% of adults aged at least 18 years were considered overweight in 2014, and 13% were considered obese.(1) While the prevalence of obesity in the Kingdom of Saudi Arabia (KSA) is 28.7%, it is higher among the women (33.5% vs. 24.1%).[2]

Nowadays, morbid obesity is the cause of many years of disability.[3] Moreover, morbid obesity and its sequelae cause pressure on government.[2] In 2030, the health burden of obesity in the United States could exceed 500 billion US dollars.[4] In 2010, overweight and obesity caused 3.4 million deaths worldwide, resulting in 3.9% years of life lost and 3.8% disability adjusted life years.[5]

Several dietary approaches have proven to be effective for weight management, reduction of risk factors, and disease prevention.[6] Whatever the approach, the best predictor of successful weight loss is adherence to dietary recommendations.[6] Many studies have shown that diet can decrease the modifiable risk factors for coronary heart diseases as the 1ry and 2ry bases for their prevention.[7]

A calorie-restricted diet for anybody with a BMI of at least 25 is the most important factor for weight loss.[7] Moreover, a diet higher in dietary protein could improve weight loss rate and blood lipid profile; however, these interventions do not have long-term effects.[7] Therefore, new strategies that increase dietary adherence are indeed needed so that patients can more easily get the most health benefits.[6]

Key areas of personalization in nutrition are choosing sufficient energy values and specifying the amount of micronutrients and

macronutrients such as protein, fats, and carbohydrates, all of which affect the development of obesity co-morbidities.[7]

To prevent co-morbidities, consideration of individual patient characteristics (sex, age, heredity, nutritional status, and physical activity) is becoming increasingly important in individualized diets.(7) Diet personalization provides a positive impact on chronic disease risk factors and QoL, and it increases the effectiveness of diet-therapy.[7]

Many studies show that obese people face major impairments in QoL; greater obesity is related to greater impairment in QoL while QoL improves following weight loss.[3] However, it remains unclear whether QoL is better or worse following weight loss as a dietary response.[8] These interventions include various recommended dietary approaches such as calorie restriction alone, fat restriction alone, combined calorie and fat restriction, and a low-carbohydrate, high-protein, low-sodium/high-potassium regime for replacing the energy deficit necessary for weight loss.[8,9] The most frequently applied approach was calorie restriction.[8,9] In 2014, a systematic review showed that 71% of these studies used the Short Form 36 (SF-36) to measure QoL.[8] Unfortunately, there is a scarcity of studies in the KSA assessing QoL in adult (aged more than 18 years) obese patients undergoing a weight reduction program at King Fahad General Hospital in Jeddah in 2017.

MATERIALS AND METHODS

This quasi-experimental study was conducted at King Fahad General Hospital in Jeddah in 2017. Obese adults aged more than 18 years and with BMIs of at least 35 were enrolled. Any patient who was illiterate or had a history of bariatric surgeries was excluded. Open Epi ™ information was used to calculate the appropriate sample size, which was 53, assuming an effect size of QoL after the weight reduction program of 0.577 (mean ± standard deviation of 11.1 ± 1.5) and a power of 80%.[10] An additional 37 individuals were included to compensate for potential loss during follow-up. Consecutive sampling in the Clinical Dietician Clinic was conducted for six months. In those who underwent a weight reduction program (low fat/high fiber, 55% carbohydrate, 20% protein, and 25% fat with a 500-calorie reduction), QoL was assessed before and three months after intervention. Study tools included anthropometric measurements (height in cm, weight in kg, BMI (weight divided by the square of height in meters)) which were assessed pre- and post-intervention in each study participant. The SF-36, used for assessing QoL, constitutes 8 sub-scales as provided by the RAND Corporation (Santa Monica, CA, US). As a result of the Medical Outcomes Study, the SF-36 consists of generic, coherent, and easily-measured QoL domains. Its use relies on patient self-reporting, and these methods are now widely utilized by many health care organizations for routine monitoring and assessment of patient-centered outcomes. Its internal consistency, equivalent-forms, and test-retest reliability were estimated for the eight multi-item scales in the Arabic and English versions in 1998, and these were subsequently approved by RAND Corp. It includes demographics, physical functioning, role limitation due to physical problems, role limitation due to emotional problems, energy/fatigue, emotional well-being, social functioning, bodily pain, and general health assessments. A frequency distribution was used to describe categorical variables, and means and standard deviations were used to describe quantitative variables. Significance was measured using the paired Student t test (for parametric normally-distributed variables). Significance was recognized when the p-value was less than 0.05. Approval letters assured patients that all data would remain confidential and would not be disclosed except for study purposes. To maintain confidentiality, data entry and statistical analyses were carried out by study investigators only. All procedures were performed at King Fahad Hospital, Jeddah, Ministry of Health. The authors have no conflict of interest with any third party.

Table 1: Characteristics of the Study Group

CHARACTERISTIC	No	%
Sex:		
Male	18	20.0%
Female	72	80.0%
Age (years):		
<30	16	17.8%
≥30, <40	29	32.2%
≥40, <50	25	27.8%
≥50	20	22.2%
Education:		
Primary	16	17.8%
Intermediate	12	13.3%
Secondary	35	38.9%
Bachelor	24	26.7%
Postgraduate	3	3.3%

*Based on the chi-square test**Statistically significant*

Table 2: Mean difference in Weight Reduction Following Intervention

Weight Reduction Intervention	Weight (kg)		Paired difference			p*
	Mean (SD) before	Mean (SD) after	Mean difference	95% CI of the mean difference		
				Lower	Upper	
	109.4 (18.2)	107.2 (18.2)	-2.2	-3.26	-1.18	<0.001**

*Based on the paired sample t test   **Statistically significant*

**Table 3: Mean Scores in the Health Concept Domains of the SF-36**

HEALTH CONCEPT DOMAIN	Before intervention mean ± SD	After intervention mean ± SD	p*
Physical functioning	51.2 ± 25.09	67.8 ± 24.97	<0.001**
Role limitations due to physical health	41.2 ± 35.76	68.2 ± 39.66	<0.001**
Role limitations due to emotional health	51.5 ± 42.42	67.1 ± 41.00	0.002**
Energy/Fatigue	48.4 ± 18.86	52.5 ± 20.88	0.085
Emotional wellbeing	60.1 ± 19.96	64.2 ± 21.56	0.026**
Social functioning	62.7 ± 71.43	71.4 ± 28.81	0.004**
Pain	56.2 ± 25.41	63.5 ± 28.14	0.002**
General health	55.5 ± 14.58	56.0 ± 17.31	0.742

*Based on the paired sample t test   **Statistically significant*

Table 4: Mean Magnitude of Change in Response to Health Concept Domains in the SF-36

Health concept domain	Mean ± SD	p*
Physical functioning	17.7 ± 27.96	<0.001**
Role limitations due to physical health	26.9 ± 41.11	<0.001**
Role limitations due to emotional health	15.6 ± 43.12	0.002**
Energy/Fatigue	4.2 ± 20.91	0.085
Emotional wellbeing	4.1 ± 15.83	0.026**
Social functioning	8.8 ± 18.92	0.004**
Pain	7.3 ± 20.06	0.002**
General health	0.6 ± 15.50	0.742

*Based on independent sample t test   **Statistically significant*
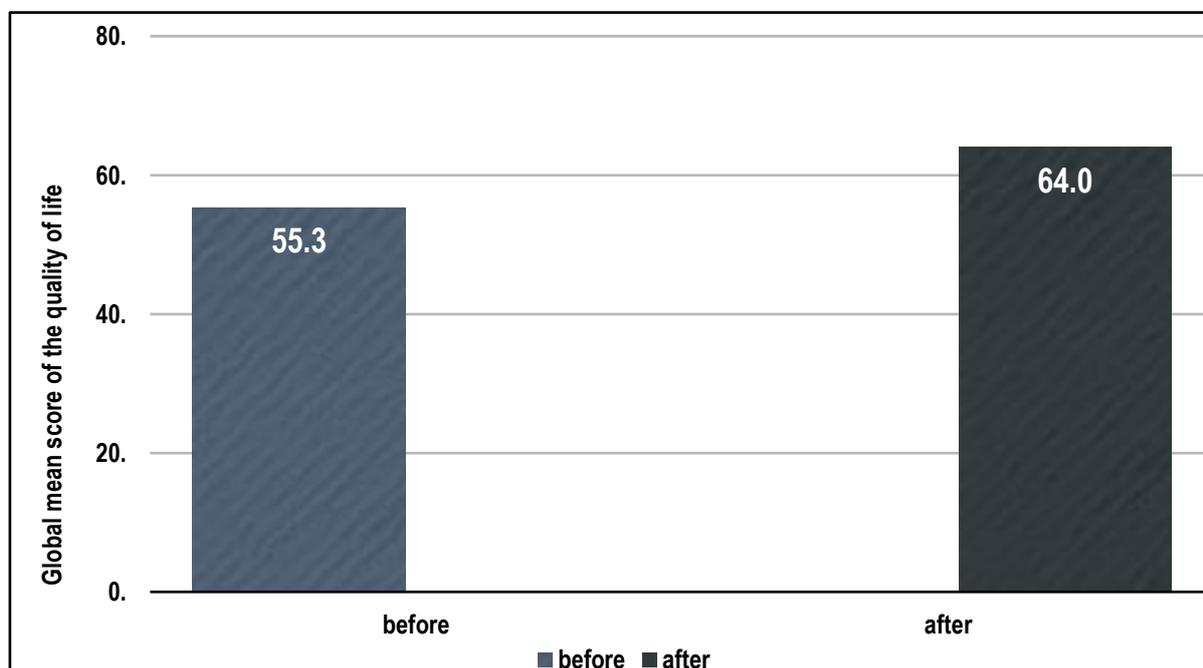
Figure 1: Changes in the Global Mean Score of Quality of Life Before and After the Weight Reduction Program

RESULTS

Response rate was 85.5% (77/90). Table 1 describes participant demographics, and Tables 2 and 3 and Figure 1 describe the mean difference in weight reduction following intervention and QoL using RAND's SF-36 as well as global QoL. Women constituted the majority of participants (80%, Table 1). A higher proportion of participants were aged at least 30 but less than 40 years (32.2%) than aged less than 30 years (17.8%), and 38.9% had secondary degrees. As shown in Table 2, a significant (p < 0.001) reduction in weight was seen (109.4 ± 18.2 kg to 107.2 ± 18.2 kg) after the weight reduction program. The change in weight was -2.2 ± 0.34 kg (mean ± standard error). Table 3 illustrates the mean response scores for the domains of health concepts, demonstrating a significant increase (p < 0.05) in most domains, but in the energy/fatigue domain and overall perception of general health, no statistically significant change was seen. Table 4 shows the mean scores for responses in the domains of health concepts, illustrating a significant increase in most domains but not in the energy/fatigue domain and overall perception of general health. Figure 1 shows a significant increase in global QoL score (55.3 ± 16.1 to 64.0 ± 19.1). The increment of magnitude was significantly higher post-intervention (8.7 ± 10.8).

DISCUSSION

The treatment of obesity and its co-morbidities has a significant financial burden on health service sources.[11] However, this study was designed to determine whether QoL improved after intervention using conservative weight loss programs at the Ministry of Health's hospital in Jeddah.

Our sample showed larger variation in the male:female ratio (1:4), presumably because women tend to be more concerned about their body image.[12] Many tried conservative approaches before proceeding to more invasive ones (i.e., gastric balloon or sleeve gastrectomy) because of fears of sequelae from the procedure itself or of sequelae from rapid weight loss such as decreased tone or excessive skin, which can then require another cosmetic intervention.[13] A high proportion of patients aged less than 40 years were found in our sample; however, those aged at least 50 years constituted a greater proportion of the sample than those aged less than 30 years. Many patients were referred from other clinics to achieve control of diseases affected by obesity, particularly diabetes, osteoarthritis, and other chronic diseases.[14]

Weight was reduced from 109.4 ± 18.2 kg to 107.2 ± 18.2 kg among participants in this study. However, the mean (± standard error) difference in weight (-2.2 ± 0.34 kg), while small, was significant (p < 0.001). The weight loss found in other studies based on a very low calorie diet was 25.4 ± 1.3 kg (p < 0.0001).(15) These studies used diabetic patients and found more weight loss with better glycemic control compared to standard nutritional intervention. This was not the case in our study, where we implemented a 500-calorie dietary deficit.[15] In a systematic review of weight loss after dietary interventions where all studies showed some weight loss, the loss ranged from 0.8 to 10.0 kg.[8]

Our study showed significant improvement in most (6 of 8) domains of QoL even though the mean reduction in weight was 2 kg. As seen in many other studies, a calorie restriction of 1,200 to 1,500 kcal daily was associated with improvements in QoL domains, but no studies clearly indicated whether these improvements were independent of weight loss.[8]

Vitality and general health domains were not significantly different (p-values were 0.085 and 0.742, respectively), but this could have been because follow-up was short (3 months).[15] A previous study, based on a weight-loss initiative where participants received weekly dietary sessions, cognitive behavioral therapy, and an exercise therapist for 12 weeks then weekly group exercise sessions for an additional 12 weeks, revealed improvements in health-related QoL domains including vitality.[16] That study showed that the most significant improvement was in vitality, possibly because of the longer program duration, the addition of cognitive behavioral therapy, and guided exercises; however, it included participants with lower BMIs compared to our study. The baseline mean weight was not given.[16]

As a result of our study, significant improvements in physical functioning (17.7 ± 27.96) and role limitations due to physical health (26.9 ± 41.11) were found. Global QoL improved after intervention (55.3 ± 16.1 to 64.0 ± 19.1; p < 0.05). However, these changes are not known to be the result of weight loss; studies do not agree. For instance, adoption of a healthier lifestyle could lead to increased personal satisfaction associated with successful behavioral changes, thus improving QoL regardless of weight loss.[8]

CONCLUSION

The weight reduction program is associated with improvements in most QoL domains, primarily in role limitations due to physical and emotional health.

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