

Pharmacist Intervention after Bariatric Surgery and Its Association with Dietary Practice, Weight Reduction, and Quality of Life

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Abstract Background: Health-related quality of life (HRQOL) is increasingly acknowledged as a significant endpoint in research on the effectiveness of bariatric surgery. Aim of the Study: Assessment of the role of pharmacist educational intervention & training in weight reduction, improvement of dietary practice, and enhancement of HRQOL after bariatric surgery. **Patient and Method:** A randomized comparative interventional study was conducted in Najaf Governorate, Iraq. The Intervention group included 58 patients who received standard care and training educational and support programs. The standard care group included 58 patients who received standard care after bariatric surgery. The required information included age, gender, practice recommended physical activity, cause and type of surgery. In addition to body mass index, dietary practices, and quality of life (assessed by MOOREHEAD-ARDEL score) were assessed at 3 and 6 months after surgery. **Results:** There reduction of the body mass index was larger in the intervention than the standard care group at 3 months and 6 months. The overall total mean MOOREHEAD-ARDEL score a significantly higher in the intervention than standard care group at 6 months, ($P < 0.001$). The mean total scores of dietary practices was significantly higher in the intervention group at 6 months compared to the standard care group at 6 months ($P\text{-value} < 0.001$). **Conclusion:** The pharmacist intervention leads to larger weight reduction, better dietary practice, and better quality of life at six months after surgery.

Key Words bariatric surgery, pharmacist intervention, weight reduction

1. Introduction

Obesity is considered a chronic disease with fat accumulation excess in the body. Overweight and obese people are at a higher risk for many serious diseases than people with a normal weight [1]. About one-third of the population is classified as overweight or obese due to the twofold increase in the prevalence of overweight and obesity worldwide since 1980 [2]. After bariatric surgery, the patients are followed up by a multidisciplinary team of healthcare specialists for at least two years. Then, they continue with yearly monitoring of nutritional status with a description of appropriate supplementation [3], [4]. Postoperative dietary recommendations are based on gradual progression in food consistency and texture over 1 to 2 months with generally recommended measures [5], depending on the nutritional management guidelines, the overall diet of patients after bariatric surgery includes 10–35% protein, 30–70% g/d car-

bohydrates, 20–35% fats, and 5 servings of vegetables a day [6]. Individuals aspiring to sustain their weight reduction may necessitate engaging in physical activity for a duration exceeding 300 minutes per week (for instance, one hour of moderately intense activity for five days a week). The provision of encouragement and assistance from healthcare professionals can significantly contribute to the facilitation of patients' weight reduction, as well as the amelioration of their metabolic abnormalities, mitigation of obesity-related comorbidities, and enhancement of their overall vitality and self-assurance [7]. HRQOL is defined as a "concept that represents the patient's general perception of the impact of an illness and its treatment on physical, psychological, and social aspects of life". Obesity and its complications are one of the main contributors to the deterioration of HRQOL. Accordingly, HRQOL and other patient-reported outcomes are increasingly acknowledged as significant endpoints in re-

search on the efficacy of bariatric surgery [8]. Furthermore, a post-treatment improvement in the patient's HRQOL should be acknowledged as a significant factor influencing continued adherence to the doctor's recommendations rather than just being seen as an extra efficacy metric [9], [10]. Anyhow, it should be noted that objective clinical outcome indicators, like excess weight loss, do not always adequately reflect the patient's subjective sensations [10].

Aim of the study: Assessment of the role of pharmacist intervention & training in weight reduction, improvement of dietary practice, and enhancement of HRQOL after bariatric surgery.

2. Patients and Method

A randomized comparative interventional study was conducted during the period from the 18th of May 2023 to the 1st of January 2024 in Al-Najaf Al-Ashraf Teaching Hospital and Al-Batool Private Hospital in Iraq. A convenient sample of 116 patients aged ≥ 18 years and scheduled for bariatric surgery was included; 58 patients in the intervention group got standard care along with instructional and supportive programs via direct and indirect communication. 58 patients who had standard treatment following bariatric surgery were part of the standard care group.

The study was proposed and subsequently approved by the Ethical and Scientific Committee of the Faculty of Medicine/Kufa University (the official letter dated 9/5/2023), the Scientific Committee of Research of Najaf Health Directorate (the official letter No. 20728 dated 18/5/2023), and Al-Batool Private Hospital (the official letter No. 3524 dated 24/5/2023).

The data was collected using validated English and Arabic questionnaires which had been reviewed and revised by a panel of experts. The required information included age, gender, practice recommended physical activity, cause of surgery (elective or medical), type of surgery (sleeve or bypass) in addition to body mass index, dietary practices, and quality of life (assessed by MOOREHEAD-ARDEL score) were assessed at 3 and 6 months after surgery. This questionnaire consists of five questions regarding self-esteem, disposition for physical activities, social life, disposition for work, and sexual activity. Each of the five questions had five possible answers including much less (-0.5), less (-.25), same (0), more (0.25), and much more (0.5) except for the self-esteem question, the score was much worse (-1), worse (-.5), same (0), better (0.5), and much better (0.1). The total score for all five questions ranged from -3 to 3. Then, the final values of the questionnaire were categorized into five classes: very poor (-3.00 to -2.25), poor (-2.00 to -0.75), fair or no alteration (-0.50 to +0.50), good (0.75 to 2.00), and very good (2.25 to 3.00). Any question not answered was scored zero [11]. The intervention was achieved through direct interviews at different times including preoperative intervention, postoperative intervention, at three months postoperative, at six months postoperative, and when the patient requested. In addition, the patients were kept in contact in the

following ways: 1. Personal contact by phone call three times weekly and when the patients requested; 2. By "WhatsApp" groups for patients for daily discussion, recommendations, and group therapy. In addition, a small book was prepared and included advice and regimen of treatments, physical activity, and proper dietary practice, this book was distributed to all participants in the intervention group. The intervention included the following subjects; The main benefits of the surgery with an expected time interval to get these benefits, the main complications that would be expected and the main risk factors for these complications, mainly the preventable risk factors with proper ways to avoid them, the correct use of postoperative treatment and supplements and the importance of adherence, highlight the importance and proper ways of physical practice, and dietary practice according to the current guidelines, and psychological intervention includes psychological support and advice in addition to adding treatment as the patients need in correlation with the opinion of the surgeon. Continuous data were presented as mean \pm standard deviation (SD). Descriptive data were presented as frequency and percentage. Continuous variables and the generated scores of variables were tested for statistical normality distribution, then t-test was used to compare the variables between groups. For categorical data, Chi-square test and Fisher's exact test were used. The level of significance was set as P. value of less than 0.05.

3. Results

The study involved two groups with 58 patients in each, namely, intervention and standard care groups. Both groups were almost matched for age and gender (P. value = 0.906 and 0.385, respectively) (Table 1).

As shown in (Table 2), there was no significant difference between the study groups regarding the cause of surgery (P-value >0.05), elective surgeries were performed for 75.9% of the patients in the standard care group and 79.3% of patients in the intervention group. Sleeve operation was the most commonly performed surgery in both groups where it was performed in 87.9% and 89.7% of patients in the standard care and intervention groups, respectively (P-value > 0.05).

The body mass index was significantly reduced in both groups at 3 months and 6 months, with a reduction rate of 27.7% in the standard care group compared to 32% in the intervention group (P-values =0.001 for both). Comparison of the mean difference in body mass index revealed a larger reduction in the intervention than the standard care group at 3 months (P-value=0.029) and 6 months (P-value=0.039), as shown in Table 3.

The comparison of mean total scores of dietary practices between and within groups at 3 and 6 months of follow-up revealed no significant difference in mean score between both groups at the 3 months, (P-value=0.598) and significantly higher mean score in the intervention group at 6 months compared to standard care group at 6 months (P-value <0.001) with a percentage change of 82.5% and 19.1%, respectively,

Variable		Standard care (n=58)		Intervention (n=58)		P. value
		No.	%	No.	%	
Age (year)	<30	20	34.5	23	39.7	0.906**
	30 - 39	17	29.3	15	25.9	
	40 - 49	16	27.6	14	24.1	
	≥ 50	5	8.6	6	10.3	
Mean (±SD)		34.7 (±9.5)		34.1 (±11.5)		0.770#
Gender	Male	12	20.7	16	27.6	0.385**
	Female	46	79.3	42	72.4	
Practice recommended physical activity	Yes	3	5.2	1	1.7	0.618 *
	No	55	94.8	57	98.3	

* Fisher's exact test; **Chi-Square; #t-test

Table 1: Baseline demographic characteristics of the studied groups

Variable		Standard care (n=58)		Intervention (n=58)		P. value
		No.	%	No.	%	
Cause of surgery	Elective	44	75.9	46	79.3	0.656
	Medical	14	24.1	12	20.7	
Type of surgery	Sleeve	51	87.9	52	89.7	0.769
	Bypass	7	12.1	6	10.3	

Table 2: Cause and type of bariatric surgery of the studied groups

Body mass index	Standard care (n=58)		Intervention (n=58)		P. value between groups
	Mean	SD	Mean	SD	
Baseline	47.2	9.8	46.1	7.5	0.491
At 3 months	38.5	8.8	34.8	8.9	0.029
At 6 months	34.2	8.6	31.3	5.4	0.039
Mean difference	-13.06	1.23	-14.76	0.86	0.001
Percentage change	-27.7%	3.1%	-32.0%	2.9%	
P. value within group	<0.001 sig		<0.001 sig		
Effect size			0.40	Small	

Table 3: Comparison of changes in body mass index of the studied group before and after intervention

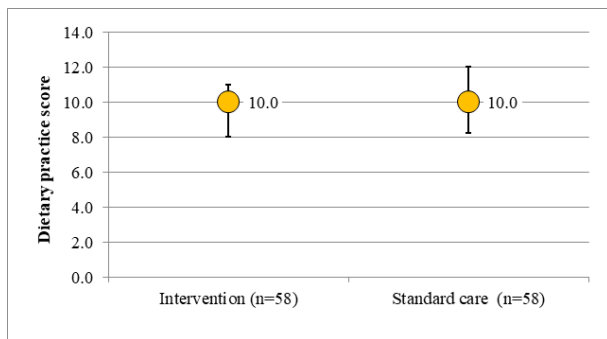


Figure 1: Marker-Line Plot showing the comparison of median Dietary practice score (Marker) and interquartile range (upper-lower lines) at third month of follow-up

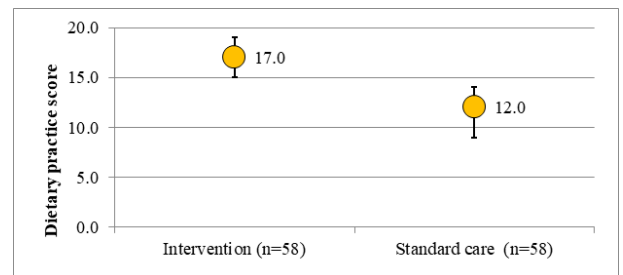


Figure 2: Marker-Line Plot showing the comparison of median Dietary practice score (Marker) and interquartile range (upper-lower lines) at the sixth month of follow-up

(Table 4, Figure 1, and Figure 2).

Furthermore, the overall total mean MOOREHEAD-ARDEL score was significantly increased in the intervention group from 0.71 ± 0.56 at 3 months to 1.65 ± 0.36 at 6 months giving an increment of 133%. In the standard care group, there was a significant increase in the mean scores from 0.62 ± 0.56 to 1.11 ± 0.55 with a percentage rate of 79% indicating a larger difference in the intervention than standard care group, ($P < 0.001$) (Tables 5, Figures 3, and Figure 4).

From another point of view, the distribution of patients in both groups according to their MOOREHEAD-ARDEL

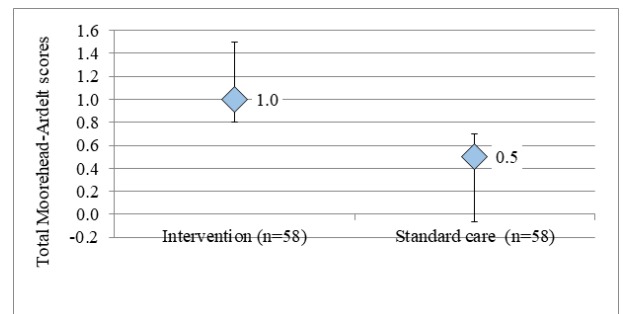


Figure 3: Marker-Line Plot showing the comparison of median MOOREHEAD-ARDEL score and interquartile range (upper-lower lines) at three months of follow-up

Dietary practice	Group				P. value between groups
	Standard care (n=58)		Intervention (n=58)		
	Mean	SD	Mean	SD	
At 3 months	9.4	3.4	9.7	2.2	0.598
At 6 months	11.2	3.1	17.7	1.1	<0.001
Mean difference	1.80	0.43	8.00	0.22	<0.001
Percentage change	19.1%	3.2%	82.5%	2.5%	
P. value within group	0.006		<0.001		
Effect size			3.10	Large	

Table 4: Comparison of mean total scores of dietary practices between and within groups at 3 & 6 months of follow-up

	Group				P. value between groups
	Standard care (n=58)		Intervention (n=58)		
	Mean	SD	Mean	SD	
At 3 months	0.62	0.56	0.71	0.56	0.678
At 6 months	1.11	0.55	1.65	0.36	<0.001
Mean difference	0.49	0.07	0.94	0.06	<0.001
Percentage change	79%	11.0%	133%	9.2%	
P. value within group	<0.001		<0.001		
Effect size			1.18	Large	

Table 5: Comparison of mean total MOOREHEAD-ARDEL score at 3 and 6 months of follow-up

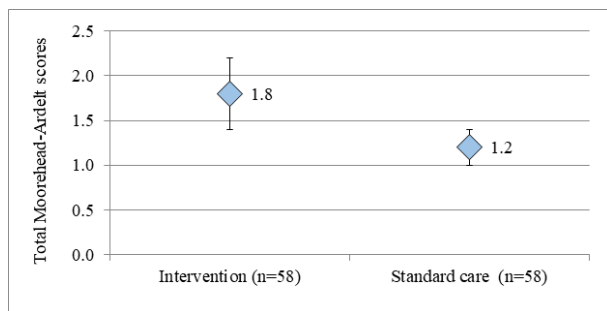


Figure 4: Marker-Line Plot showing the comparison of median total MOOREHEAD-ARDEL score and interquartile range (upper-lower lines) at the sixth month of follow-up

score revealed significantly higher frequency good levels in the intervention group (8/58) compared to only (1/58) in the other group at 3 months. Much increase in the frequency of good and very good scores at the 6 months was reported in the intervention group while none of the patients in the standard group had very good level (P-values were 0.048 and <0.001, respectively), (Table 6).

4. Discussion

Inadequate weight reduction or regain results in a decline in life satisfaction and a recurrence or worsening of comorbidities associated with obesity [12], [13]. This study was done to evaluate the potential benefit of pharmacist intervention to improve weight reduction, dietary practice, and HRQOL. In the current study, the pharmacist intervention was associated with significantly better weight reduction. These results agreed with the results of a systematic review of intervention studies that was done by Skye et al. which concluded that post-operative intensive multidisciplinary team interventions increased post-operative weight loss [14]. As revealed in another study that was done by Melanie et al., Many patients

gain back part of the weight they lost, and some patients do not reach their intended weight loss goals. Behavioural, dietary, and psychological intervention by qualified health professionals can all play a role in optimizing long-term weight loss [15]. Khee et al. concluded that pharmacists, endocrinologists, and advanced practice nurses developed the collaborative prescription practice model, which offers a workable and sustainable approach to support the best possible results following bariatric surgery, including the advancement of weight loss [16]. The current study revealed that dietary practices were significantly improved by pharmacist intervention. In the same line, another study that was done by Francesca et al. revealed that Bariatric patients may benefit from a prompt postoperative lifestyle intervention to improve and sustain surgical results. Given the increasing prevalence of bariatric surgery, it is imperative that it be viewed as a means of establishing a healthy lifestyle rather than a means of achieving a specific outcome in the treatment of obesity [17]. A significantly better HRQOL was achieved by pharmacist intervention as revealed by the MOOREHEAD-ARDEL score. The same results were obtained in another study that was done by Skye et al. post-operative intensive multidisciplinary team interventions were associated with a better HRQOL [14]. The systematic review of 18 studies revealed that bariatric surgery seems to provide a persistent benefit in terms of HRQOL, especially its physical component score, but psychologically, it seems that certain people will not profit as much after bariatric surgery. Accordingly, early inclusive care, including psychological intervention, results in further improvement of the HRQOL [10].

5. Conclusion

The pharmacist intervention leads to larger weight reduction, better dietary practice, and better quality of life at six months after surgery.

Moorhead Quality of life		Group				P. value between groups*
		Standard care (n=58)		Intervention (n=58)		
		No.	%	No.	%	
At three months	Very poor	1	1.7	0	0.0	0.048
	Poor	0	0.0	1	1.7	
	Fair	56	96.6	49	84.5	
	Good	1	1.7	8	13.8	
	Very good	0	0.0	0	0.0	
At six months	Very poor	0	0.0	0	0.0	<0.001
	Poor	2	3.4	0	0.0	
	Fair	20	34.5	5	8.6	
	Good	36	62.1	44	75.9	
	Very good	0	0.0	9	15.5	
P. value within group*		<0.001		<0.001		
* Fisher's exact test used in comparison						

Table 6: Level of Quality of life assessed by MOOREHEAD-ARDEL score in both studied groups at 3 and 6 months of follow-up

Conflict of interest

The authors declare no conflict of interests. All authors read and approved final version of the paper.

Authors Contribution

All authors contributed equally in this paper.

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