Assessment of Compliance for Postoperative Patients with Bariatric Surgery

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Abstract

Background: Obesity remains a continuing global health concern that associated with increased risk of numerous chronic diseases. Bariatric surgery is indicated as a strategic alternative for rapid weight loss, remission or improvement of co-morbidities. **Aim:** This study aimed to assess compliance for postoperative patients with bariatric surgery. **Design:** A descriptive study design was utilized to achieve the aim of this study. **Setting:** The study was conducted in bariatric surgery outpatient clinic and bariatric surgery department at El-Demerdash Hospital of Ain Shams University. **Subject:** A purposive sample of 104 patients with postoperative bariatric surgery who are selected according to certain inclusion criteria. **Tools of data collection:** (1) Postoperative bariatric surgery patients' interview questionnaire. (2) Patients' compliance assessment questionnaire. **Results:** The results of this study showed that 80 percent of the studied patients had poor level of compliance postoperative bariatric surgery. **Conclusion:** The current study concluded that most of the studied patients had poor level of compliance postoperative bariatric surgery. **Recommendations:** The current study recommended that, developing of guidelines protocol regarding patients' compliance post-operative bariatric surgery to maintain health and improve patients' outcomes.

Key words: Assessment, Postoperative Bariatric Surgery, Patients' Compliance.

Introduction

Obesity negatively affects health outcomes and increases the risk of metabolic diseases (for example type 2 diabetes mellitus and fatty liver disease), cardiovascular diseases (hypertension, myocardial infarction and stroke), musculoskeletal disease (osteoarthritis), Alzheimer disease, depression and some types of cancer (for example, breast, ovarian, prostate, liver, kidney and colon). In addition, obesity might lead to reduced quality of life, unemployment, lower productivity and social disadvantages **(Blüher, 2019).**

Body Mass Index (BMI) is defined as the extent to which body weight, muscle and fat are congruent to height, frame, gender and age. It can be calculated by dividing a persons' weight by the height square (kg/m^2) **(Moorhead et al., 2018).**

According to BMI, general population is classified in five categories: underweight BMI < 18.5 kg/m^2, normal weight BMI 18.5-24.9 kg/m^2, class I

obesity - overweight BMI 25.0-29.9 kg/m^2, class II obesity - BMI 30.0-39.9 kg/m^2, class III obesity - extreme obesity BMI > 40 kg/m^2 **(De Lorenzo et al., 2016).**

Bariatric surgery is now considered the first management option for failure of medical treatment in severely obese subjects and the most effective method for sustained long-term weight loss. Bariatric surgical options may be grouped into three main categories: malabsorptive, restrictive, and mixed procedure. Malabsorptive procedures reduce the size of the stomach, although they function primarily by creating malabsorption. They effectively reduce nutrient absorption in small bowel which leads to weight loss **(Funes et al., 2020; Rothrock, 2015).** Four common types of procedures are Gastric Bypass, Gastric Banding, Sleeve Gastrectomy, Biliopancreatic Diversion with Duodenal Switch **(Dewit & Kumagai, 2013; Shah et al., 2016).**

The number of bariatric surgery procedures performed worldwide increased from 146,000 to 340,000 between 2003 and 2011, with Roux-en-Y gastric bypass and sleeve gastrectomy type which accounts for approximately 75 % of all procedures **(Thorel et al., 2016).**

The specialist bariatric nurse should give support to the nursing staff caring for bariatric patients to ensure policies and protocols are adhered to and a high quality of evidence-based care is delivered. In order to provide continuity of care for the surgical patient after discharge from the hospital, the nurse need to consider what type of assistance the patient requires in the home setting according to their individual needs **(Martinez, 2014).**

All current clinical guidelines indicate that bariatric patients should be regularly evaluated after surgery and that a long-term commitment from both the patient and the bariatric surgical team is required. The frequency of follow-up visits should be adapted to the procedures, patients compliance and lifestyle change **(Maleckas et al., 2016).**

Patients are required to commit to following lifelong healthy lifestyle and behavioral modification postoperative bariatric surgery such as eating, physical activity habits and medical follow-up. So, patients may be required to undergo monthly visits for 3, 6, or 12 months to maintain or lose a specific amount of body weight. In addition to, close follow-up of the glycaemic control, blood lipid profile, obstructive sleep apnea, gastro esophageal reflux disease, body weight, quality of life, eating behavior and bone health **(Varban & Dimick, 2019; Busetto et al., 2017).**

Significance of the study:

Proposed causes of weight regain or insufficient weight loss post-surgery include inadequate follow-up support by the multidisciplinary team, maladaptive eating and lifestyle behaviors, non compliance to therapeutic regimen physical side effects of surgery, low patient knowledge, psychological disorders, use of medications associated with weight gain. Better assessment of these behavioral factors, can help identify patients at risk for sub-optimal outcomes.

Aim of the Study:

This study aimed to assess compliance of patient's postoperative bariatric surgery.

Research question:

To what extent the patient with postoperative bariatric surgery is compliant with therapeutic regimen?

Subjects and Methods:

A- Research design:

A descriptive exploratory research design was conducted to achieve the aim of this study.

B- Setting:

The study was conducted in bariatric surgery outpatient clinic and bariatric surgery department at El-Demerdash Hospital affiliated to Ain Shams University.

C- Subject:

A purposive sample of 104 postoperative bariatric surgery patients was selected according to certain inclusion criteria. With type I error with significant level alpha (α) = 0.05 (confidence level 95%).

Inclusion criteria:

The study subject was selected according to the following criteria:

- Postoperative patients with bariatric surgery.
- Age over 18 years.
- Willing to participate in the study.
- Both sexes.
- Patients with obesity related co-morbidity.

D-Tools of data collection

1- Postoperative bariatric surgery patients' interview questionnaire: It was developed by the researcher in an Arabic language based on review of relevant literatures as **(Centers for Disease Control and Prevention, 2017; Wicker & Dalby, 2017; American Society for Metabolic and Bariatric Surgery, 2016; Linton, 2016; DeMaria & Ansari, 2016)** and it includes two parts:

Part I: It was concerned with assessment of demographic characteristics of patients under study such as age, gender, residence, level of education, marital status and occupational state.

Part II: It was concerned with the assessment of patients' clinical data such as present medical history, past medical history and family history.

2- Patients' compliance assessment questionnaire: This tool was used to assess patients' compliance with diet, medication, physical activity, sleeping, stress management and follow-up postoperative bariatric surgery. It was developed in an Arabic language using the following related literatures **(American Society for Metabolic and Bariatric Surgery 2018; Still etal., 2018; Kumar & Gomes 2017; Lim, Baker & Jones, 2015 and Rothrock, 2015).**

This tool was divided into four parts:

Part I: patients' compliance to post operative bariatric surgery instructions: This part was used to assess patients' compliance post-operative bariatric surgery. It includes 54 statements which were grouped into 5 sections that include diet post-operative bariatric surgery (20 items), physical activity (14 items), sleeping and rest post-operative bariatric surgery (7 items), smoking post-operative bariatric surgery

(8 items) and follow-up post-operative bariatric surgery (5 items).

Scoring system

This part consisted of 54 statements, the response to each statement were either with Yes (given one grade) or No (given zero).

- The total score for every section was calculated by summing the patients' responses, and then the total scores for the entire questionnaire were calculated.

- The total scores for every item and the total score of the questionnaire were categorized into good, fair and poor compliant as follow:

- < 50% was considered poor compliance.

- 50%- 75% was considered fair compliance.

- ≥ 75% was considered good compliance.

Part II: Medication Adherence Rating Scale (MARS): This scale was adopted from **(Thompson et al, 2000).** It includes 10 statements to assess patients' compliance to medication post-operative bariatric surgery. Patient who responds by "NO" to the questions from 1- 6 and questions from 9 -10 and by "YES" to questions 7 and 8 are considered compliant to medication.

Scoring system

This scale includes 10 statements. The response to the statement is by either Yes (given one grade) or No (given zero). The total score for every statement was calculated first and then the score for the questionnaire was calculated and were categorized as follow:

- 0-3 was considered non-adherent.

- 4-6 was considered partially adherent.

- 7-10 was considered adherent.

Part III: Perceived Stress Scale (PSS): This scale was adopted from **(Cohen et al., 1983).** This scale was used to assess patients' stress level post-operative bariatric surgery. Patients were asked about their feelings and thoughts during the past month and they have to indicate how often they felt or thought a certain way in response to 10 questions.

Scoring system:

Perceived Stress Scale (PSS) items was rated on a scale from zero to 4 where zero mean (never), 1 mean (almost never), 2 mean (sometimes), 3 mean (fairly often), and 4 mean (very often). Questions number 1, 2, 3, 6, 9, 10 are negative statements, while questions number 4, 5, 7, 8 are positive statements. Four items were reverse coded, and all items were summed to obtain total scores as the following:

0-13 was considered low stress.

- 14-26 was considered moderate stress.

- 27-40 was considered high perceived stress.

Part IV: Bariatric Analysis and Reporting Outcome System (BARO) and Moorehead-Ardelt quality of life Questionnaire: this questionnaire was adapted from **(Moorehead et al., 2003)** to assess changes in quality of life after treatment. It includes five domains

expressed by graphic symbols, each one of them had scoring point as follow; self-esteem (-1 to +1), physical activity (-0.5 to +0.5), social life (-0.5 to +0.5), work conditions (-0.5 to +0.5) and sexual activity (-0.5 to +0.5). Points are added or subtracted according to changes in these domains.

Total questionnaire scoring system:

- One point or less was considered failure.
- > 1 to 3 points was considered fair.
- > 3 to 5 points was considered good.
- > 5 to 7 points was considered very good.
- > 7 to 9 points was considered excellent.

Tools validity and reliability

- Validity was tested through a jury of seven experts from medical surgical nursing department, faculty of nursing and faculty of medicine, Ain Shams University (2 professors in nursing, 3 assistant professors in nursing and 2 medical lecturers). The experts reviewed the tools for clarity, relevance, comprehensiveness, simplicity, understanding and applicability. Minor modifications were done. Testing reliability of the developed tools was done statistically by using Alpha Cronbach test. Total compliance was 0.766, total medication adherence rating scale was 0.848, total perceived stress scale was 0.722 and for total BARO score was 0.661.

- **Pilot Study:**

A pilot study was carried out on 10% (10) of patients to test the applicability of the study and to test clarity of the designed tool, as well as to estimate the time needed for each tool. The modifications were done for the used tools then the final form was developed. Patients of the pilot study were excluded from the study subjects.

Field Work:

- To carry out the study, an approval was obtained from the hospital directors and nursing directors of bariatric surgery outpatient clinic and bariatric surgery department at Ain Shams University Hospital. A letter was issued to them from the faculty of nursing Ain Shams University explaining the aim of the study in order to obtain permission and cooperation to conduct the study.

- The researcher started by selecting the patients who performed bariatric surgery and met the inclusion criteria. The researcher explained the aim and nature of the study to patients prior to data collection in order to take their approval to participate in the study.
- The studied patients were recruited from bariatric surgery outpatient clinic and bariatric surgical department.
- The patient interview questionnaire that includes demographic characteristics, patient's clinical data, and family history was filled in by the researcher or the patients or family member according to their level of education.
- Patient's compliance tool was filled in by the researcher or the patients or family member according to their level of education. It takes about 30-45 minutes to be filled in for every patient.

- Data collection was done on Sunday and Tuesday of each week because these days are determined for bariatric patients in the out-patient clinic. Data was collected in the morning and afternoon shifts, for a period of six months, starting at December 2018 until the end of April 2019.

Administrative Design:

An official letter was issued from the Faculty of Nursing, Ain Shams University to the director of inpatient bariatric surgery department and bariatric surgery outpatient clinics at which the study was conducted, explaining the purpose of the study to obtain their permission to conduct this study.

Ethical Considerations:

- The research approval was obtained from the ethical committee of faculty of nursing before initiating the study work.
- The researcher clarified the objectives and aim of the study to patients included in the study.
- Patients' oral consent to participate in the study was obtained.
- The researcher assured maintaining anonymity and confidentiality of subjects` data.
- Patients were informed that they are allowed to withdraw from the study at any time without giving any reasons and without penalties.

Statistical Design:

The data were collected, coded and entered into a suitable excel sheet. Data were transferred into SPSS for window, version 20.0 Armonk, NY: IBM Crop. Quantitative data were presented as mean, standard deviation. Qualitative data were presented as percentages. The observed differences and association were considered as follows:

- Non-significant at $P > 0.05$
- Significant at $P \leq 0.05$

Limitation of the study

1- The time available for data collection was not enough, as most of patients come from far cities and need to leave hospital as early as possible.

2- Unsuitable environment and the interview were held in the outpatient clinic where there was too much noise and lack of privacy.

Results

Regarding demographic characteristics of the studied patients, table (1) shows that mean age was 32.57±6.18. Regarding patients' gender, it was found that, 75.0% of the studied patients were females. As regards to residence, it was found that 72.1% were living in urban area. Regarding educational level, the result shows that 49% of the studied patients had diploma education. As well, 77.9% of the studied patients weren't working. In relation to marital status of the studied patients, it was found that 64.4% were married.

Table (2) demonstrates that, 93.3%, 76.5%, 62.5% of the studied patients had poor compliance regarding physical activity, stop smoking, diet after bariatric surgery. While, 49.0% of them were good compliance regarding follow-up visits after bariatric surgery.

Table (3) illustrates that, 41.3% of the studied patients were non adherent to medication postoperative bariatric

surgery. While, 39.4% of the studied patients were partially adherent and 19.3% of them were adherent to medication postoperative bariatric surgery.

Table (4) illustrates that, 56.7% of the studied patients had moderate level of stress postoperative bariatric surgery. While, 32.7% of the studied patients had high level of stress and 10.6% of them had low level of stress postoperative bariatric surgery.

Table (5) reveals that, 64.4% of the studied patients had less labor level post operative bariatric surgery. While, 53.8%, 45.2% and 32.7% of them had the same level of compliance regarding self-esteem, sexual activity, social life postoperative bariatric surgery.

Table (6) reveals that there was statistically significant relation between total patients' compliance and their demographic characteristics post operative bariatric surgery that include age, gender, level of education and occupation with ($P<0.05$). While, there was no statistically significant relation between their compliance and residence and marital state post operative bariatric surgery ($P>0.05$).

Table (1): Percentage distribution of the studied patients according to their demographic characteristics (n=104).

Items	Studied patients	
	N	%
Age		
18 < 30	17	16.3
30 < 40	64	61.5
40 < 50	17	16.3
≥ 50	6	5.9
Mean ±SD		32.57±6.18
Gender		
Male	26	25.0
Female	78	75.0
Residence		
Rural	29	27.9
Urban	75	72.1
Educational level		
Can't read and write	22	21.2
Diploma education	51	49.0
Higher education	31	29.8
Occupational state		
Free work	7	6.7
Governmental work	14	13.5
Not working	81	77.9
Others	2	1.9
Marital status		
Single	27	26.0
Married	67	64.4
Widow/ Divorced	10	9.6

Table (2): Percentage distribution of total compliance among studied patients post operative bariatric surgery (n=104)

Items of compliance	Good		Fair		Poor	
	N	%	N	%	N	%
Compliance to diet after bariatric surgery	11	10.6	28	26.9	65	62.5
Compliance to physical activity	0	0.0	7	6.7	97	93.3
Compliance to sleep and rest instructions after bariatric surgery	40	38.5	30	28.8	34	32.7
Compliance to smoking cessation after bariatric surgery	0	0.0	4	23.5	13	76.5
Compliance to follow-up after bariatric surgery	51	49.0	34	32.7	19	18.3
Total compliance	1	1.0	19	18.3	84	80.8

Table (3): Percentage distribution of total patients' compliance with medication post operative bariatric surgery (n=104)

Total Medication Adherence	N	%
Adherent	20	19.3
Partially adherent	41	39.4
Non adherent	43	41.3

Table (4): Percentage distribution of total patients' perceiving of stress post operative bariatric surgery (n=104)

Total perceived Stress Scale	N	%
High stress	34	32.7
Moderate stress	59	56.7
Low stress	11	10.6

Table (5): Percentage distribution of patients' compliance regarding quality of Life post operative bariatric surgery (n=104).

Items	Much less		Less		The same		More		Much more	
	N	%	N	%	N	%	N	%	N	%
Self-esteem	0	0.0	37	35.6	56	53.8	10	9.6	1	1.0
Physical activities	29	27.9	23	22.1	32	30.8	15	14.4	5	4.8
Social life	22	21.2	25	24.0	34	32.7	13	12.5	10	9.6
Labor (work condition)	12	11.5	67	64.4	25	24.0	0	0.0	0	0.0
Sexual	0	0.0	5	4.8	47	45.2	52	50.0	0	0.0

Table (6): Relation between patients' total compliance and their demographic characteristics post operative bariatric surgery (n=104).

Items		Total compliance							
		Good		Fair		Poor		Chi-square	
		N	%	N	%	N	%	X^2	P-value
age	18 < 30	1	1	0	0	16	15.4	12.773	0.047*
	30 < 40	0	0	13	12.5	51	49.0		
	40 < 50	0	0	3	2.9	14	13.4		
	≥ 50	0	0	3	2.9	3	2.9		
Gender	Male	1	1	11	10.6	14	13.5	17.076	<0.001**
	Female	0	0	8	7.6	70	67.3		
Residence	Rural	0	0	5	4.8	24	23.0	0.430	0.807
	Urban	1	1	14	13.5	60	57.7		
Level of education	Can't read and write	0	0	1	1.9	21	20.1	27.651	<0.001**
	Middle level education	1	1	3	2.9	47	45.2		
	High education	0	0	15	14.4	16	15.4		
Occupation	Free work	0	0	3	2.9	4	3.8	72.472	<0.001**
	Governmental work	0	0	8	7.6	6	5.7		
	Not working	0	0	8	7.6	73	70.1		
	Others	1	1	0	0	1	1		
Marital status	Single	1	1.9	2	1.9	24	23	2.517	0.642
	Married	0	0	11	10.6	56	53.9		
	Widow/ Divorced	0	0	6	5.8	4	3.8		

Non significant p>0.05 * Statistical significant P<0.05

Discussion

Regarding demographic characteristics of the studied patients, the result of the present study revealed that, about two thirds of the studied patients, their age ranged from 30 < 40 years old with mean age 32.57±6.18. This is may be due to that this age is called early adulthood during which people are care about their body image and general appearance.

This finding is consistent with **Lin and Tsao (2018)** who revealed that the average age of the studied participant was 34.5 years. While the result is contradicted with **Susmallian et al., (2019)** who found that the mean age of the study group was 67.92 years old.

As regards to gender, the result clarified that, three quarters of the studied patients were females. This may be due to that females are caring more about their body image and appearance than men, in addition to that female patients in this study had sedentary lifestyle and they reported higher intake of sugars and fatty foods that predispose them to obesity and other chronic diseases. This result is agree with **Carbajo et al. (2018)** who

found that nearly three quarters of studied patients were females.

Regarding residence, the current study revealed that, nearly three quarters of the studied patients were from urban areas. This may be due to the nature of industrial life in the urban area where the fast food restaurants present, people using elevator instead of climbing stairs, lack of activity and more social activities where people usually prepare large amounts of high fat foods. All these issues reflect the unhealthy lifestyle of people living in urban areas which make them more prone to obesity.

This result is consistent with **Bergmann and Tabone (2015)** who found that the majority of the studied patients were from non-rural dwelling residence.

In relation to educational level, approximately half of the studied patients were diploma education. This finding may explain the average social standard for patients who are receiving treatment at El-Demerdash hospital which is considered a governmental hospital that provide its services at low price. This result is supported by **Twells et al., (2017)** who reported that three quarters of the studied patients was post-secondary education. While this finding is contradicted with **Zhu, Norman and While (2013)** who found that nearly half of the studied patients were bachelor degree.

Regarding occupational state, majority of the studied patients are not working. This is may be due to that three quarters of the studied patients were females and are house wives. This result is consistent with **El-dawoody (2016)** who found that more than half of the studied patients are not working.

Regarding marital status, approximately two thirds of the studied patients were married. The studied patients clarified that they are following sedentary lifestyle, didn't practice any physical activities, watching television for long time and had hormonal changes due to pregnancy, all these issues can lead to unhealthy weight gain. This finding goes in the same line with **Vieira et al., (2020)** who stated that more than half of the studied patients were married.

As regards total patients' compliance, the current study reveals that, most of the studied patients had poor level of physical activity postoperative bariatric surgery. This may be due to that the studied patients didn't received instructions on how to perform physical exercise as well as didn't given guidelines for lifestyle modification post-operative bariatric surgery. This result is cotradicted with **Coen et al., (2018)** who revealed that two thirds of the studied patients successfully completed the recommended physical exercise intervention at the first six months after bariatric surgery which reflect positive significant association between physical exercise and weight loss outcomes.

As regards to smoking cessation after bariatric surgery, more than three quarters of the studied patients didn't quit smoking. This is may be due to that patients need to be more knowledgeable about the benefits to stop smoking, they should try to change their daily habits in order to reduce their reliance on cigarettes as much as possible to avoid its harmful effect after surgery.

This result is supported by **Lent et al. (2013)** who reported that smoking habits score did not change after surgery in either bariatric procedure and current smokers did not quit smoking.

The current study represented that, more than two thirds of the studied patients were not compliance to diet postoperative bariatric surgery. This may be due to that the studied patients didn't received necessary instructions on the importance of compliance to diet post operative bariatric surgery. This result is consistent with **Maghrabi et al. (2019)** who reported that patients need additional educational sessions to ensure adequate communication and learning of all core recommendations regarding eating after bariatric surgery.

The current study illustrated that approximately half of the studied patients had good compliance with follow-up post postoperative bariatric surgery. This may be due to the clarification of the importance of follow up visits to improve weight loss outcomes, identify complications early and lead to better health outcomes after bariatric surgery. This study finding comes in agreement with **Dagan et al. (2017)** who reported that most of studied patients attend to follow-up visit after surgery. While, this finding is contradicted with **Kob et al., (2015)** who revealed that more than half of the studied patients were not attend to follow-up after surgery when feel better.

As regards to total medication adherence, the current study findings showed that near half of the studied patients were non adherent to medication after bariatric surgery and little of them were adherent to medication. This is clarified by **Modi et al., (2013)** who stated that patients unable to eat solid foods for several weeks after operation that hinder their ability to swallow a large multivitamin pill, and even a chewable vitamin may not be as palatable postoperatively as it was preoperatively

This result is consistent with **Hood et al., (2016)** who reported that medication adherence tends to be good in the early post-surgery period, 90% of patients taking supplements daily.

Regarding stress perceiving management, the present study finding clarified that more than half of the studied patients had moderate level of stress. This explained that patients didn't received instructions on how to manage stress they face after bariatric surgery and how to practice stress relieving measures. This result is agree with **Boniecka, et al., (2017)** who reported that, near half of the studied patient had a moderate level of stress.

Regards quality of life, more than two thirds of the studied patients had less level of work condition post operative bariatric surgery. This may be due to insufficiency of health status which affects patients' work performance after bariatric surgery that helps in improving the quality of life. This finding is contradicted with **Alkassis et al., (2019)** who found that there was a significant improvement in patients' quality of life domains after surgery and no patient had a very poor or poor quality of life score.

Regarding the relation between patients' total compliance and their demographic characteristics, the result of the current study revealed that there was statistically significant relation between total studied patients' compliance and their demographic characteristics post operative bariatric surgery that include age, gender, level of education and occupation. This may be due to that demographic characteristics are one of the factors that affect positively on patients' compliance after bariatric surgery.

This finding is consistent with **Belo et al., (2018)** who reported that there is no significance association

between follow up adherence and patients' age, gender, level of education and occupation.

Conclusion

The study revealed that most of the studied patients had poor level of compliance postoperative bariatric surgery and more than half of them had moderate level of stress. In addition, near half of the studied patients were non adherent to medication postoperative bariatric surgery. Moreover, there was a statistically significance relation between studied patients' compliance and their demographic characteristics.

Recommendations

The result of this study projected the following recommendations:

I – for patient:

- Bariatric surgery modules, pamphlets and simple booklet should be available for patients to illustrate and simply explain lifestyle modification post-operative bariatric surgery.

- Lifestyle modification module should be applied in all bariatric surgery units and bariatric surgery clinical outpatients and updated periodically to enhance patients' health and outcomes.

II- In services:

- Establishing programs in hospitals, focusing on both short and long-term care for patients undergoing bariatric surgery, with the aim of assisting their adherence to recommendations.

III- In research:

- Further researches are recommended to study the factors affecting patients' compliance post-operative bariatric surgery. As well as more intervention researches are needed to develop a cohesive and comprehensive body of evidence upon which to base bariatric nursing care to improve patients' outcomes.

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