

# Morbid obesity and mental health of women

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**ABSTRACT**--In a study of a different degree of evidence, the mental status of 487 morbidly obese patients was analyzed. It turned out that patients of especially young age more often had a high risk of developing depression. The study clearly established a strong proportional correlation between weight loss and a decrease in depression severity [8].

**Keywords**-- morbid obesity, bariatric surgery, mental health.

## I. INTRODUCTION

Obesity is a major public health concern. The number of patients affected by this modern epidemic and accompanying diseases is constantly increasing, along with its associated complications and health care costs, making the fight against obesity one of the most important challenges [1]. Today, it has already been clearly established that if the BMI  $\geq 30$  kg/m<sup>2</sup> is defined as obesity, and serious change in somatic health, which is characterized by abnormally high body weight, BMI  $\geq 40$  kg/m<sup>2</sup>, is defined as morbid obesity. It is important to note that it can also be diagnosed for people with BMI of  $\geq 35$  kg/m<sup>2</sup> in the presence of the serious complications connected with obesity such as hypertension or diabetes [2]. The fact that the risk of mortality significantly increases already at BMI of  $\geq 30$  kg/m<sup>2</sup> should be noted as well, and especially expressed negative effect of obesity on patients' health is already observed at BMI of  $\geq 40$  kg/m<sup>2</sup>, and the risk of mortality doubles [3]. In addition to these chronic disorders, obesity is also associated with reproductive and obstetric complications like menstrual disorders, infertility, endometrial hyperplasia and cancer, and adverse obstetric and perinatal outcomes [4].

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An equally important component of quality of life is the state of mental health of women suffering from morbid obesity.

It is in this context that nowadays a special attention is paid to mental stress, cognitive and emotional disorders and personality anomalies of women with morbid obesity [5,6,7].

It has been found that the risk of detecting psychopathological disorders significantly increases with patients whose body mass index (BMI) > 25 kg/m<sup>2</sup>.

Numerous studies of domestic colleagues have shown that more than half of the patients suffering from morbid obesity, revealed some sort of mental disorders. The structure of mental illness was overwhelmingly dominated by anxiety and affective disorders [5,6,7].

In a study of a different degree of evidence, the mental status of 487 morbidly obese patients was analyzed. It turned out that patients of especially young age more often had a high risk of developing depression. The study clearly established a strong proportional correlation between weight loss and a decrease in depression severity [8].

It is logical to assume that mental health disorders in morbidly obese patients have a high frequency, heterogeneity and variability of clinical manifestations. The most striking manifestation of mental illness in women of studied cohort is the disturbance of adaptation to stress. Stress, as a phenomenon that affects women of different ages, is associated with various psychosomatic aspects of mental illness: malaise, sleep problems, chronic fatigue syndrome, etc. But, no patient with this disease will point to existing mental health disorders. Due to the purpose of diagnosing latent mental health disorders, special testing using qualitative questionnaires is necessary.

## **II. THE PURPOSE OF THE STUDY**

Assessing the quality of mental health of morbidly obese women before and after bariatric surgery.

## **III. STUDY DESIGN**

A randomized, prospective and comparative clinical trial.

## **IV. MATERIAL AND RESEARCH METHODS**

The study included 110 (n = 110) morbidly obese reproductive patients stratified into two groups depending on the type of bariatric intervention. Patients of the first group (n = 55) underwent surgical correction using laparoscopic mini gastric bypass, the second (n = 55) - laparoscopic gastroplasty selected by "blind" method. The control group was 30 (n = 30) of conditionally healthy women with normal body weight (BMI = 18.5 - 24.9 kg/m<sup>2</sup>) of the same age without disturbance of menstrual and fertile function.

*The criteria for inclusion in the research were:*

- Women suffering from morbid obesity (BMI over 40 kg/m<sup>2</sup>);
- Reproductive age (19- 44 years);
- Informed consent to participate in the study.

*The criteria for exclusion were:*

- the age of women less than 19 and older than 44 years (pre and postmenopausal);
- pregnancy and lactation;
- the presence of contraindications for bariatric operations (exacerbation of gastric ulcer and duodenal ulcer);
- the presence of severe somatic diseases in the stage of decompensation;
- the presence of cancer;
- mental disorders;
- lack of proper patient discipline, non-compliance with recommendations and the possibility of participation in long-term post-operative observation.

In order to assess the anthropometric status, the Kettle index (Kipping C. et al., 2010), also called the Body Mass Index (BMI), was determined by the following formula:

$$BMI (kg/m^2) = \frac{body\ weight, kg}{(height, m)^2}$$

The Scale of Psychological Stress "PSM-25" according to Vodopyanova N. E. was applied to identify the role of the psychosomatic component in the initiation and maintenance of symptoms of mental illness in patients of the studied cohort [9]. The patients had to choose a number from 1 to 8 after the proposed questions, corresponding to their condition in the last few days. The test results were interpreted based on the calculated points: if there were less than 99 points, they were defined as: low stress level, 100-125 - medium level, more than 135 - high stress level.

In order to process and interpret the results of the PSM-25 test, the sum of all responses is calculated - an integral psychological stress index (PSI). As a result, the group of examined patients was divided into 3 subgroups: 1 - high stress level, testified to the state of maladjustment and mental discomfort; 2 - average stress level – testified to neuro-mental tension, psychological maladjustment; 3 - testified to the state of complete psychological adaptation to workloads.

It should be noted that none of these questionnaires replaced the detailed clinical examination of patients by psychiatrists. These methods were used as a convenient auxiliary tool for diagnosing latent forms of mental illness.

Statistical processing of the array of received data was carried out using the software package SPSS 7.5 for Windows (IBM Analytics, USA). The average arithmetic and RMS deviations were calculated. The correspondence of these data to normal distribution was confirmed with the application of the Kolmogorov–Smirnov criterion. For comparison of two samples, the t-criterion was used with the significance level of  $p < 0.05$ .

## V. RESULTS OF A RESEARCH

Patients suffering from morbid obesity were between the ages of 19 and 44, with an average age of  $29.8 \pm 5.9$ . The age of women in control group statistically did not differ ( $p \geq 0.05$ ).

The research analyzes all key mental health parameters of the cohorts studied and women in the control group, based on the questionnaire, according to the scale of "PSM-25" survey (Table 1).

**Table 1:** Psychological stress level according to "PSM-25 " scale, n (%), before operation.

Studied groups	N	Low level		Average level		High level	
		abs.	%	abs.	%	abs.	%
I group (n=55 ) L-s GB	55	13	23,6*	20	36,3* *	22	40,1*
II group (n=55 ) L-s GP	55	10	18,1 **	22	40,1* *	23	41,8***
Total patients with morbid obesity (n=110)	110	23	20,9 *	42	38,1* *	45	40,1
III Control group (n = 30) women with normal body weight (BMI = 18.5 - 24.9 kg/m2)	30	20	66,7* *	7	23,3**	3	10,1*** *

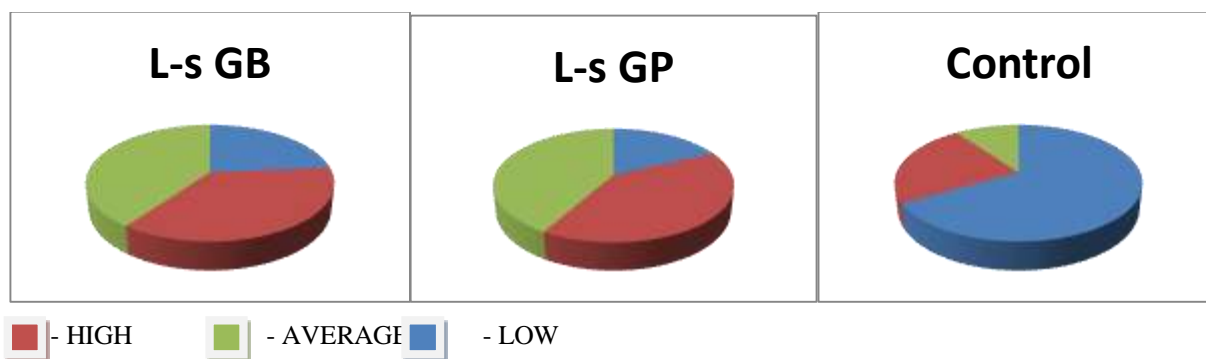
Note:

\* Between groups I and III;

\*\* Between groups II and III;

\*\*\* Between groups II and III;

Reliable statistical differences were revealed using the Fischer criterion with Yates' correction ( $p < 0.05$ ).



**FIGURE 1:** REPRESENTATION OF PARAMETERS

Comparing the results of the survey of the 3 test groups before the operation according to the PSM-25 Scale, it can be noted that a high level of stress most significantly by 4.1 and 4.2 times, respectively, was observed in groups I and II, in comparison with those of the control group ( $p < 0.05$ ). Disorders of psychological adaptation to stress of average severity are recorded – by 1.5 and 2.0 times more often, respectively, while low stress level is 3.0 times less common in groups of patients with morbid obesity ( $p < 0.05$ ). Reliable statistical differences were revealed using the Fischer criterion with Yates' correction ( $p < 0.05$ ). High levels of stress in the patients of studied cohort testified to a state of total maladjustment and mental illness to the standard psychological stress, and to the need for a wide range of tools and techniques to reduce neuro-mental stress, psychological relief, with the direct involvement of a psychiatrist.

The next stage analyzed the results of psychological testing 6 and 12 months after the operation (table 2)

**Table 2:** Psychological stress level according to "PSM-25" scale, n (%), 6 months after surgery

Studied groups	N	Low		Average		High	
		abs.	%	abs.	%	abs.	%
I group (n=55) L-s GB	55	26	47,2 *	14	25,4 **	15	27,3*
II group (n=55) L-s GP	55	14	25,4 **	21	38,1 **	20	36,3* **
Total patients with morbid obesity (n=110)	110	40	36,3 *	35	31,8 **	35	31,8
III Control group (n = 30) women with normal body weight (BMI = 18.5 - 24.9 kg/m2)	30	20	66,7 **	6	20,0 **	4	13,3* ***

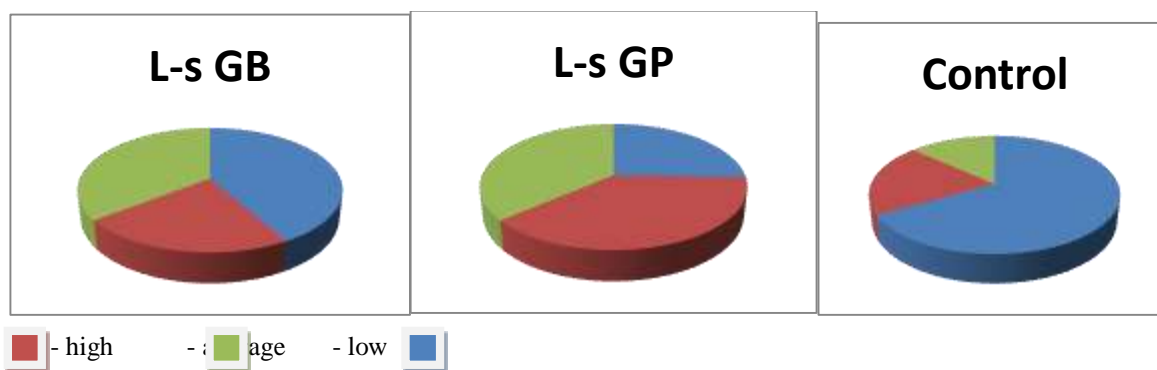
Note:

\* Between groups I and III;

\*\* Between groups II and III;

\*\*\* Between groups II and III;

Reliable statistical differences were revealed using the Fischer criterion with Yates' correction ( $p < 0.05$ ).



**Figure 2:** revealed using the Fischer criterion

Comparing the results of the psychological testing of 3 groups under study, 6 months after the operation, it should be emphasized that there is a tendency to decrease the overall level of stress in both groups of patients suffering from morbid obesity. In addition, the number of patients with high and medium stress levels in group I became 1.5 times less than in group II ( $p < 0.05$ ), respectively. Reliable statistical differences were revealed using the Fischer criterion with Yates' correction ( $p < 0.05$ ). The obtained data indicates the redistribution of mental illness parameters after surgery towards the state of full psychological adaptation to workloads.

Similarly, all key parameters of mental health of group II patients after laparoscopic gastroplasty were studied (Table 3).

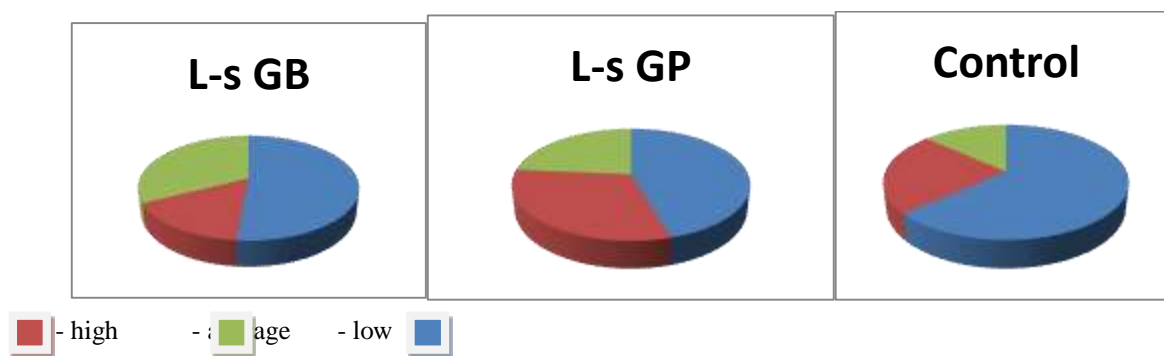
**Table 3 :** Psychological stress level according to "PSM-25 Psychological Stress Scale," n (%), 12 months after surgery

Studied groups	N	Low		Average		High	
		abs	%	abs.	%	abs.	%
I group (n=55 ) L-s GB	55	35	63,6*	11	20,0**	9	16,3*
II group (n=55 ) L-s GP	55	25	45,4**	17	30,9**	13	23,6***
Total patients with morbid obesity (n=110)	110	60	54,5*	28	25,5**	22	20,0
III Control group (n = 30) women with normal body weight (BMI = 18.5 - 24.9 kg/m2)	30	19	63,3**	7	23,3**	4	13,3****

Note:

- \* Between group I and III s;
- \*\* Between groups II and III;
- \*\*\* Between groups II and III;

Reliable statistical differences were revealed using the Fischer criterion with Yates' correction ( $p < 0.05$ ).



**Figure 3:** revealed using the Fischer criterion

Similarly, after 6 and 12 months after laparoscopic gastroplasty, the stress frequency of high severity decreased by 0.8 and 0.5 times, compared to the pre-surgery indicators.

In general, 12 months after the operations, the positive trend toward reducing high stress levels was maintained in all patients of the cohort under study. However, statistically significant differences are 1.5 times, respectively, between patients who have undergone laparoscopic gastric bypass and gastroplasty ( $p < 0.05$ ). Reliable statistical differences were revealed using the Fischer criterion with Yates' correction ( $p < 0.05$ ).

Our results in general are consistent with the opinion of local researchers, where the high frequency of psychopathological and psychological characteristics of women suffering from morbidly obesity was also shown [7]. The researchers also found a high frequency of anxiety and depressive disorders, as well as personality changes or expressed accentuation of personality traits complicated by impulsive and protest forms of response [7].

## VI. CONCLUSIONS

1. The mental distress syndrome in patients suffering from morbid obesity, is the state of psychological maladjustment to standard workloads. This is evidenced by a statistically significant increase in mental stress levels by more than 4.0 times in patients with morbid obesity, compared to women with normal body weight (40.1% and 41.8% against 10.1%, respectively,  $p < 0.05$ ).

2. Weight loss due to bariatric surgery as a way of treating morbid obesity has a positive effect on the mental health of the patients of the studied cohort. Total psychological maladjustment in patients with morbid obesity was stopped 1.5 times more often after laparoscopic gastric bypass, compared to the state after laparoscopic gastroplasty (16.3% against 23.6%, respectively,  $p < 0.05$ ).

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