

Assessment of dietary habits of patients with recurrent depressive disorders

Ewa Stefańska, Agnieszka Wendołowicz, Urszula Cwalina, Urszula Kowzan, Beata Konarzewska, Agata Szulc, Lucyna Ostrowska

Summary

Aim. The aim of this study was evaluation of selected dietary habits of patients with recurrent depressive disorders.

Methods. The study included 150 patients (75 patients suffering from recurrent depressive disorders and 75 healthy people aged 18-64 years). The assessment of dietary habits was carried out by using a food frequency questionnaire.

Results. It has been shown that in the compared groups of women, patients with depression consumed significantly less groats ($p < 0.001$), rice ($p = 0.02$), red meat ($p < 0.01$), fish ($p < 0.01$), vegetables ($p < 0.001$), fruits ($p < 0.01$) and wine ($p < 0.001$) in comparison with women without depression, and they were significantly more likely to consume wheat-rye bread ($p = 0.03$), cheese ($p = 0.02$), butter ($p = 0.03$), cream ($p < 0.01$), lard ($p < 0.001$), coffee ($p = 0.03$) and sugar ($p = 0.02$) in comparison with women without depression. Statistically significant differences between the two groups of men were diagnosed in the frequent intake of lard ($p < 0.001$) and less frequent vegetable oils ($p < 0.01$), beer ($p = 0.01$), and fast food ($p < 0.01$) for men with depression compared with men in the control group.

Conclusions. In the treatment of patients with depression during the declared change of diet, the need for nutrition education on the principles of rational nutrition should be taken into attention, including the selection of appropriate food groups in order to ensure an optimal supply of all necessary to the proper functioning of the body's nutrients.

depression / frequency of consumption of products / adults adoptive family research methodology / adoption / adoptive family

INTRODUCTION

According to the World Health Organization (WHO), depression was the leading cause of mental illness in the nineties of the twentieth century and perhaps including cardiovascular

diseases become the most popular in the world by 2020 [1].

Research has shown that patients suffering from depression have a food pattern, which may contribute to the misuse of their nutrition. Some researchers suggest that overweight and obesity are more common in patients with bipolar disorder, while in patients with melancholic depression, unipolar character is frequently observed in underweight [2]. Research shows that patients suffering from depression are more frequent to change their eating behavior, associated with changes in appetite, food preferences, including consumption in excess of certain

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product groups, and avoid eating other [3-7]. These changes may result in, among others to a serious shortage of certain nutrients. Shortages, even moderate, especially if they last a long time, have adverse effects on human health, including, among others the proper functioning of the nervous system.

Underestimating the role of proper nutrition and a lack of systematic research in Poland monitoring dietary habits of patients with mental disorders justifies making this type of work.

The aim of this study was to evaluate selected dietary habits (eg. the number and type of meals normally, eating up between them, and the consumption frequency of selected food groups) of patients with recurrent depressive disorders.

MATERIAL AND METHODS

The study involved a group of 75 patients (55 women and 20 men, aged 18-65 years) with recurrent depressive disorders. The control group consisted of healthy volunteers (55 women and 20 men aged 18-64 years) without psychiatric disturbances, eating disorders, chronic diseases related with the metabolism of nutrients, major body weight changes in the last three months.

The main criterion for selection to the research group were identified by a psychiatry specialist, the recurrent depressive disorder, according to the classification of the International Classification of Diseases (ICD-10) [8], which lasted for five years, and the current episode of depression did not last longer than a month. History of the disease was assessed based on data from interviews and medical records available. Assessment of severity of depression was made using the Hamilton Depression Rating Scale (version 17-point), and Beck's self-esteem scale [9, 10]. Exclusion criteria which were used were: any other severe disease that affects the CNS, uncontrolled or potentially interfering medical condition, significant risk of suicide, pregnancy or lactation, known history of diabetes or lipid disorder, use of anti-diabetic or lipid-lowering therapy and special diets. Tested patients were measured body weight, height, waist and hips, then the value of body mass index and waist-to-hip ratio WHR were specified.

Patients participating in the study were informed of the purpose and methodology of research carried out, and each patient gave informed, written consent for their conduct. The study was approved by the local Ethics Committee No. RI-002/325/2011.

The assessment of dietary habits was carried out using a questionnaire. It contained, among others questions about socio-demographic situation of subjects and questions regarding the number of meals consumed, the regular consumption, eating up between meals, the type of snacks, and the frequency of consumption of selected food groups. For questions about the frequency of consumption of selected food groups, patients had to choose one of the seven following categories: the "do not consume" - "to" consume every day." For each of the categories assigned the appropriate rank as follows; not consume at all-1; I eat at least once a month-2; I eat 1-2 times a month-3; I eat once every week-4; I eat 2-3 times a week-5; I eat 4-6 times a week-6; I eat every day-7. Then the median ranks the frequency of consumption of the products concerned and IQR were determined. The calculations also used the calculation of the arithmetic mean, standard deviation and percentage calculations.

The statistical evaluation of the results was performed using the STATISTICA 10.0 PL StatSoft Inc. Normality of numerical distribution variables was checked using the Shapiro-Wilk test. Comparisons of the two groups in terms of numerical variables were made using t-Student test, for categorical variables test U Mann-Whitney was used. To assess the relationship between the characteristics of nominal χ^2 test was used. The relationship between selected variables were evaluated using the Spearman correlation coefficient. A value of $p < 0.05$ was considered significant.

RESULTS

The study included 150 subjects (75 healthy subjects and 75 patients suffering from unipolar depression) in the period September-November 2012. Current antidepressant treatment lasted no longer than a month and consisted of one antidepressant (selective serotonin reuptake inhibitors

SSRIs) and a sedative used temporarily. Mean disease duration for 53% of the women was 4 years, for 18% 2-3 years, and for 29% it was less than 1 year. A single episode of depression was reported in 31% of women, 2-4 episodes in 38%, more than 4 episodes occurred in 31% of female patients. In the group of men, for 30% mean disease duration was 4 years, for 15% 2-3 years, and for 55% it was less than 1 year. A single episode of depression affected 40% of men, 2-4 episodes were reported in 25% of men and more than 4 episodes occurred in 35% of patients. Related to the Beck self-assessment scale 42% of women have mild, 53% have moderate, and 5% have severe depressive symptoms. Related to the Hamilton depression scale 40% of women have mild, 27.5% have moderate and 32.55 have severe depressive symptoms. In group of men related to the Beck self-assessment scale 65% have mild and 35% have moderate depressive symptoms. According to Hamilton depression scale 50% of men have mild, 40% moderate and 10% have severe depressive symptoms. In the group of women 20% received paroxetine, 27.3% sertraline, 20% venlafaxine, 9% citalopram, 7.3% mirtazapine and 16.4% escitalopram. Among men 40% of respondents received sertraline, 20% venlafaxine, 15% mirtazapine, 25% escitalopram. The characteristics of the group is shown in Table 1 (*on the next page*). In comparing groups of women it is reported that women with unipolar depression had significantly higher WHR ($p < 0.001$), they were more likely to be married ($\chi^2 = 6.15$, $p = 0.01$) and had a lower level of education ($\chi^2 = 11.64$, $p < 0.01$) in comparison with women without depression. In the compared groups of men, patients with depression had a lower level of education, compared with men without depression ($\chi^2 = 6.51$, $p = 0.04$).

Table 2 (*on the next page*) presents selected dietary habits of the patients, including the number of meals consumed, their type and eating up between them. Statistically significant differences were noted only in women. Patients with depression significantly more commonly consumed fewer meals per day than women in the control group ($\chi^2 = 4.02$, $p = 0.04$), they also more often include in their daily food ration eating lunch ($\chi^2 = 5.24$, $p = 0.02$).

Table 3 (*on page 43*) shows the usual frequency of consumption of selected food products

by comparing the group of people. It has been shown that in the compared groups of women patients with depression consumed significantly less groats ($p < 0.001$), rice ($p = 0.02$), red meat ($p < 0.01$), fish ($p < 0.01$), vegetables ($p < 0.001$), fruits ($p < 0.01$) and wine ($p < 0.001$) in comparison with women without depression, and significantly more often consumed wheat-rye bread ($p = 0.03$), cheese ($p = 0.02$), butter ($p = 0.03$), cream ($p < 0.01$), lard ($p < 0.001$), coffee ($p = 0.03$) and sugar ($p = 0.02$) in comparison with women without depression. It was noted that 50% of women with depression (median frequency of consumption) consumed groats, rice with a frequency of only 1-2 times per month (50% of women without depression consumed one of these products once a week), red meat and vegetables 2-3 times week (women without depression, respectively 4-6 times a week and every day), fish, once a week (women without depression 2-3 times a week). The study also showed that 50% of women with depression consumed fruits 4-6 times a week (50% of women with no depression once a day). Lower frequency also involved in wine consumption (less than once a month vs 1-2 times a month). It was also shown that 50% of women with depression consumed such products as cheese, cream 2-3 times a week, and women with depression, 1 time per week. Products such as butter, potatoes, sugar were consumed by 50% of women with depression at a frequency of 4-6 times per week, while the control group of women it was a frequency of about 2-3 times a week or once. It was also found that women with depression more often in their daily diet ate wheat-rye bread and coffee. The studies also reported consumption of lard, which was consumed by 50% of women with depression at least once a month, while women without depression completely exclude the product from your diet.

Statistically significant differences between the two groups of men were diagnosed in the frequent intake of lard ($p < 0.001$) and less frequent vegetable oils ($p < 0.01$), beer ($p = 0.01$), and fast food ($p < 0.01$) for men with depression compared with men in the control group. It has been shown that 50% of men with depression consumed lard at least 1-2 times a month (50% of men without depression has not eaten this at all). The products such as vegetable oils are consumed by men with depression 2-3 times a

Table 1. Sample characteristics

Characteristics	Female		p value	Male		p value
	Patients (n=55)	Controls (n=55)		Patients (n=20)	Controls (n=20)	
Age (years)	45.8±12.2	41.1±13.1	0.06	46.7±11.3	38.2±13.2	0.03
Body height (cm)	162.8±5.4	162.1±5.2	0.37	177.3±5.7	179.2±8.4	0.42
Body weight (kg)	70.7±14.5	69.2±10.6	0.50	89.1±12.3	86.9±7.5	0.50
BMI (kg/m ²)	26.8±5.3	27.0±5.3	0.79	28.5±3.7	27.2±3.0	0.28
WHR (waist-hip ratio)	0.88±0.2	0.82±0.07	<0.001	0.93±0.06	0.92±0.07	0.48
Marital status						
Married	35(63.6%)	22(40.0%)	0.01	7(35.0%)	5(25.0%)	0.49
Unmarried	20(36.4%)	33(60.0%)		13(65.0%)	15(75.0%)	
Education						
primary	20(36.4%)	14(25.4%)	<0.01	10(50.0%)	5(25.0%)	0.04
secondary	30(54.6%)	21(38.2%)		5(25.0%)	2(10.0%)	
higher	5(9.0%)	20(36.4%)		5(25.0%)	2(10.0%)	
Baseline HAM-D score	14.0±7.3	-	-	10.3±5.17	-	-
Baseline Beck score	24.4±12.8	-	-	16.9±13.3	-	-

Values are given as mean±standard deviation or n (%)

Table 2. Assessment of chosen eating habits among studied subjects

Studied feature	Female		p value	Male		p value
	Patients (n=55)(%)	Controls (n=55)(%)		Patients (n=20)(%)	Controls (n=20)(%)	
Number of meals						
≤3	24(43.6%)	14(25.5%)	0.04	11(55%)	11(55%)	1
≥4	31(56.4%)	41(74.5%)		9(45%)	9(45%)	
Type of meals						
Breakfast	51(92.7%)	49(89.0%)	0.51	18(90.0%)	16(80.0%)	0.37
Mid-morning meal	31(56.3%)	38(69.0%)	0.17	10(50.0%)	14(70%)	0.20
Lunch	5(100%)	50(90.9%)	0.02	17(85.0%)	16(80.0%)	0.68
Afternoon tea	31(56.4%)	25(45.4%)	0.25	9(45.0%)	11(55.0%)	0.53
Dinner	50(90.9%)	49(89.0%)	0.75	19(95.0%)	15(75.0%)	0.08
Additional eating between meals	48(87.3%)	41(74.5%)	0.09	17(85.0%)	13(65.0%)	0.14
Type of additional snacks	n=48	n=41		n=17	n=13	
Sweets	28(58.3%)	20(48.8%)	0.36	8(47.0%)	4(30.7%)	0.37
Fast food	1(2.0%)	1(2.4%)	0.91	1(5.9%)	2(15.4%)	0.39
Sandwiches	11(23.0%)	9(22.0%)	0.91	7(41.2%)	5(38.5%)	0.88
Fruit	8(16.7%)	11(26.8%)	0.24	1(5.9%)	2(15.4%)	0.39

Table 3. Consumption of food groups in depression patients and their controls separated by sex

Food groups	Female		p value	Male		p value
	Patients (n=55)	Controls (n=55)		Patients (n=20)	Controls (n=20)	
	Me(IQR)	Me(IQR)		Me(IQR)	Me(IQR)	
Groats	3.5(3.0;4.0)	4.0(4.0;5.0)	<0.001	3.0(3.0;4.0)	4.0(3.0;4.5)	0.16
Rice	3.5(3.0;4.0)	4.0(4.0;5.0)	0.02	4.0(3.0;4.0)	4.0(3.5;4.0)	0.51
Pasta	4.0(3.0;5.0)	4.0(3.0;5.0)	0.12	4.0(3.0;5.0)	4.5(4.0;5.0)	0.07
Wheat-rye bread	7.0(5.0;7.0)	6.0(2.0;7.0)	0.03	6.0(3.0;7.0)	5.0(2.5;7.0)	0.87
Rye bread	4.0(3.0;7.0)	5.0(4.0;7.0)	0.20	6.0(2.0;7.0)	5.5(3.0;6.0)	0.88
Rolls yeast	4.5(3.0;5.0)	3.0(1.0;5.0)	0.06	5.0(3.0;6.0)	4.0(2.0;4.5)	0.14
Milk	6.0(4.0;7.0)	5.0(5.0;7.0)	0.81	6.0(3.0;7.0)	4.5(2.0;6.5)	0.29
Yogurts	5.0(4.0;6.0)	6.0(5.0;7.0)	0.25	5.0(3.0;6.0)	4.5(3.0;6.0)	0.74
Cottage cheese	4.0(4.0;5.0)	5.0(4.0;5.0)	0.61	5.0(3.0;6.0)	4.0(3.0;4.5)	0.14
Cheese	5.0(4.0;5.0)	4.0(1.0;5.0)	0.02	5.0(4.0;6.0)	4.5(4.0;5.0)	0.45
Eggs	5.0(4.0;5.0)	4.0(4.0;5.0)	0.28	5.0(4.0;5.0)	4.0(4.0;5.0)	0.18
Red Meat	5.0(4.0;6.0)	6.0(5.0;7.0)	<0.01	5.0(4.0;6.0)	5.0(4.0;6)	0.73
Sausages	7.0(6.0;7.0)	7.0(6.0;7.0)	0.97	6.0(6.0;7.0)	6.0(5.0;7.0)	0.21
Fish	4.0(3.0;4.0)	5.0(4.0;5.0)	<0.01	4.0(3.0;4.0)	4.0(4.0;4.0)	0.09
Butter	6.5(5.0;7.0)	6.0(2.0;7.0)	0.03	6.0(2.0;7.0)	7.0(4.0;7.0)	0.30
Cream	5.0(4.0;6.0)	4.0(1.0;5.0)	<0.01	5.0(3.0;5.0)	4.0(1.0;4.5)	0.09
Lard	2.0(2.0;3.0)	1.0(1.0;1.0)	<0.001	3.0(2.0;4.0)	1.0(1.0;2.0)	<0.001
Vegetable Oils	5.5(5.0;6.0)	5.0(4.0;7.0)	0.73	5.0(5.0;6.0)	6.5(5.0;7.0)	<0.01
Potatoes	6.0(5.0;7.0)	5.0(4.0;6.0)	<0.01	6.0(4.0;7.0)	5.5(4.0;7.0)	0.57
Vegetables	5.0(4.0;6.0)	7.0(6.0;7.0)	<0.001	5.0(5.0;6.0)	6.0(5.0;7.0)	0.23
Fruits	6.0(5.0;7.0)	7.0(6.0;7.0)	<0.01	5.0(4.0;7.0)	7.0(5.0;7.0)	0.06
Pulses	3.0(2.0;4.0)	3.0(2.0;4.0)	0.75	2.0(2.0;3.0)	2.0(1.5;3.0)	0.74
Juices	4.0(3.0;5.0)	5.0(3.0;5.0)	0.97	4.0(2.0;6.0)	4.0(4.0;5.0)	0.53
Carbonated drinks	2.0(2.0;5.0)	2.0(1.0;5.0)	0.19	4.0(1.0;6.0)	4.0(2.0;5.0)	0.68
Coffee	7.0(7.0;7.0)	7.0(3.0;7.0)	0.03	7.0(3.0;7.0)	6.0(1.5;7.0)	0.35
Tea	7.0(7.0;7.0)	7.0(7.0;7.0)	0.22	7.0(6.0;7.0)	7.0(5.5;7.0)	0.53
Beer	2.0(2.0;3.0)	2.0(1.0;3.0)	0.92	3.0(2.0;4.0)	4.0(4.0;5.0)	0.01
Wine	2.0(1.0;2.0)	3.0(1.0;4.0)	<0.001	2.0(1.0;3.0)	3.0(2.0;4.0)	0.05
Spirits	2.0(1.0;2.0)	2.0(1.0;3.0)	0.58	2.0(2.0;3.0)	2.5(2.0;3.0)	0.61
Sugar	6.0(2.0;7.0)	4.0(1.0;7.0)	0.02	6.0(2.0;7.0)	6.5(1.5;7.0)	0.88
Jams	3.5(2.0;5.0)	3.0(2.0;4.0)	0.27	3.0(2.0;5.0)	2.5(2.0;5.0)	0.27
Honey	3.0(2.0;4.0)	3.0(1.0;5.0)	0.62	3.0(2.0;5.0)	3.0(1.5;5.0)	0.45
Sweets	5.0(3.0;6.0)	5.0(3.0;5.0)	0.06	5.0(4.0;6.0)	4.5(3.5;6.0)	0.34
Fast food	3.0(2.0;3.0)	3.0(1.0;4.0)	0.80	2.0(1.0;3.0)	3.0(3.0;4.0)	<0.01
Nuts	3.0(2.0;5.0)	5.0(4.0;5.0)	0.24	4.0(3.0;5.0)	4.0(3.0;6.0)	0.46

Me-median IQR-interquartile range

week (4-6 times per week for men without depression), beer 1-2 times a month (one time per week for men without depression) types of products such as fast food less than 1 time per month (1-2 times a month by men without depression). In female patients the only variable that correlated with depressive symptoms was consumption of potatoes ($r=-0.34$, $p=0.0490$). In men patients the only variable that correlated with depressive symptoms was consumption of rice ($r=0.7399$, $p=0.0230$).

DISCUSSION

The correct food pattern requires both the proper balance of energy intake and food rations sufficient quantity and quality of products providing all essentials for growth, development and maintenance of a healthy nutrients. In this paper we attempt to assess the dietary habits of selected patients with recurrent depressive disorders. Taking into account the number of meals consumed habitually it was demonstrated that women with depression significantly more often consumed fewer meals per day, having significantly more often lunch, compared with women without depression. The studies of Parka shown that women suffering from depression consumed fewer meals per day, at irregular hours, and most consumed meal was the first breakfast [5]. Furthermore, these studies have shown that patients with depression significantly less applied for variety of meals, less frequently avoided consuming spicy and salted products [5]. The results of own research shows that very popular among the examined groups of patients was the custom eating up between meals, which is confirmed by other studies [5, 11]. To the point of view of rational nutrition between meals eating up habit considered beneficial, in its composition products containing large amounts of fat should not be included, such as fast food, chips, French fries and sweets. Consumption of these products reduces the consumption of vegetables, fruits, dairy products, lean meat and fish, while contributing to the consumption of excess fat, including saturated fatty acids and trans isomers. In addition, insufficient in the diet is the supply of minerals and vitamins. In the own study, it was noted that, regardless of gender groups

compared, more depressed patients than healthy reached for sweets as an additional snacks between meals. The second most popular eating up products found in most groups are sandwiches, and in the case of men without depression fruit. The study of Liu et al demonstrated that the usual diet of patients suffering from depression differ in a statistically significant way in the consumption of convenience food, fast food, fresh fruit, but not sweets [11]. As shown by other studies in depressive episode, patients declared an increased appetite for foods rich in carbohydrates and fats selecting eg chocolate, cakes, biscuits, and giving up the fruit, vegetables, meat or fish [11]. In the study of Kampov-Polevoy, it has shown that women with depression were more likely to change food preferences under the influence of depressed mood than men, and significantly more often reported choosing sugary snacks between meals [12].

Evaluation of the frequency of consumption of selected food groups showed that the most common mistake made by the patients with depression regardless of gender was too rare consideration in daily food rations of milk and dairy products, fish, vegetable oils, fruits, vegetables, pulses. Too often in the usual diet of the patients there were, in turn, wheat-rye bread, butter, sugar and sweets. The study of Parka shown that women suffering from depression less frequently during the day consumed products such as red meat, fish, eggs, beans and more often reached the milk and dairy products compared with women without depression [5]. Low intake of fruits, vegetables, seeds, dried legumes, nuts, while in the dominance in the usual food intake of red meat and fast food by patients with depression reported in studies of other author [3, 13]. In a study conducted by Appleton et al in Ireland and France it have been shown that the increase in depressive mood was significantly correlated with a lower intake of fruit and raw vegetables, and increased consumption of eggs, offals and yellow cheese [14].

As shown by studies conducted by Akbaraly model nutrition which takes into account the high nutritional intake of fruits, vegetables and fish was associated with a lower incidence of major depressive episodes in contrast to the model nutrition which takes into account the consumption of diets rich in processed foods, frozen

foods, sweet desserts, chocolate, refined grains and high-fat dairy products [15]. As confirmed by the study of other authors a high intake of fruits and vegetables rich in antioxidants may be associated with a lower risk of having major depressive episodes [11, 16]. Some authors in the pathology associated with psychiatric disorders see the effects of free radicals, which are particularly exposed to the central nervous system, and therefore the presence of particular importance in the diet contained antioxidants include in fruits and vegetables [16]. The potential beneficial effect of the diet may also result from the presence of folate found in significant quantities in cruciferous vegetables (broccoli, cabbage, brussels sprouts), deciduous (spinach) and legumes (lentils, chickpeas) [15]. The potential protective role of folate in combating the symptoms of depression is related to their participation in the regulation of certain neurotransmitters [7, 17]. In a study of patients with neuropsychiatric disorders, low levels of serotonin metabolite 5-hydroxyindoleacetic acid (5-HIAA) was shown in the cerebrospinal fluid. Folate supplementation restored normal levels of acid [18]. In other studies it have been shown that low folate levels may increase the risk of depression and lead to reduced availability of S-adenosylmethionine, the universal donor of methyl groups, which may lead to a decreased formation of the myelin sheath, neurotransmitters and phospholipids of cell membranes [15, 17]. Because of the low folate intake in some countries (USA, Canada) the mandatory fortification of some foods is used, especially cereals by adding 0.14 mg of folate per 100 g of product [18]. There are reports according to which recommended daily intake of folate in food rations of patients with depression should be higher than normal and be 2mg/daily [19].

In the conducted own studies, also deserves attention too low in relation to the recommendations (2-3 times per week) [20] the frequency of fish consumed, on average one per week. According to other authors having a high intake of fish as a source of unsaturated fatty acids correlates with a low percentage of patients with mental disorders in the population [14, 21]. The daily need for unsaturated fatty acids is determined, 1-2 g per day for healthy people, and

doses up to 9.6 g for those with psychiatric disorders [21].

A beneficial aspect of eating fish is associated with a high content of long-chain unsaturated fatty acid ω -3. They are a major component of neuronal membranes and hold the following anti-inflammatory properties, the studies suggest beneficial antidepressant effect of eicosapentaenoic acid (EPA) than the docosahexaenoic (DHA) [22]. A negative trend recorded in the study, especially among women is also higher frequency of consumption of products from a group of fats rich in saturated fats: butter, cream, lard, which a high intake conduct to, among others the occurrence of cardiovascular disease, which studies show are today the main cause of death in developed countries [1].

The current study also has some limitations. The main limitation of this study is the small and heterogeneous sample. Due to the limited sample we could not carry out a separate analysis of these patients to find out if they have the same dietary habits against severity depressive symptoms. Another limitation is lack of data connected with socio-economic status of patients based on income ratio and amount of money spent on food products. Needless to say, this must be replicated with a larger sample to allow greater statistical power. However, we intend to follow-up this group prospectively in order to assess changes in nutritional manner during the course of the illness and as a function of depressive symptoms.

CONCLUSIONS

Summarizing the results of the research it should be noted that the dietary habits of the patients with depression were not in line with the criteria of rational nutrition. Most dietary errors committed were the low number of meals per day (≤ 3 , especially among women), select additional snacks sweets and a low frequency of consumption of milk and dairy products, fish, fruits and vegetables, other foods rich in fiber (rye bread, pulses). Therefore, it seems appropriate that in the treatment of patients with depression during the declared changes in the diet care should be taken to the need for nutrition education on the principles of rational nutrition, in-

cluding the selection of appropriate food groups in order to ensure an optimal supply of all necessary for the proper functioning of the body components nutrients.

REFERENCES

1. Eby GA, Eby KL. Magnesium for treatment-resistant depression: a review and hypothesis. *Med Hypothesis*. 2010; 74: 649-660.
2. Berlin I, Lavergne F. Relationship between body mass index and depressive symptoms in patients with major depression. *Eur Psychiatry*. 2003; 18: 85-88.
3. Appelhans BM, Whited MC, Schneider KL, Ma Y, Oleski JL, Merriam PA et al. Depression severity, diet quality, and physical activity in women with obesity and depression. *J. Acad. Nutr. Diet*. 2012; 112: 693-698.
4. Kontinen H, Männistö S, Sarlio-Lähdenkorva S, Silventoinen K, Haukkala A. Emotional eating, depressive symptoms and self-reported food consumption. A population study. *Appetite*. 2010; 54: 473-479.
5. Park JY, You JS, Chang KJ. Dietary taurine intake, nutrients intake, dietary habits and life stress by depression in Korean female college students: a case-control study. *Journal of Biomedical Science*. 2010; 17 (suppl. 1): S40-S44.
6. Peet M. International variations in the outcome of schizophrenia and the prevalence of depression in relation to national dietary practices: an ecological analysis. *B J Psych*. 2004; 184: 404-408.
7. Sanhueza C, Ryan L, Foxcroft DR. Diet and the risk of unipolar depression in adults: systematic review of cohort studies. *J Hum Nutr Diet*. 2013; 26: 56-70.
8. World Health Organization. International statistical classification of diseases and health-related problems. Geneva: World Health Organization; 1992.
9. Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry*. 1960; 23: 56-62.
10. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry*. 1961; 4: 53-63.
11. Liu Ch, Xie B, Chou Ch, Koprowski C, Zhou D, Palmer P et al. Perceived stress, depression and food consumption frequency in the college students of China seven cities. *Physiol Behav*. 2007; 92: 748-754.
12. Kampov-Polevoy AB, Alterman A, Khalitov E, Garbutt JC. Sweet preference predicts mood altering effect of and impaired control over eating sweet foods. *Eat Behav*. 2006; 7: 181-187.
13. Grossniklaus DA, Dunbar SB, Tohill BC, Gary RN, Higgins MK, Frediani J. Psychological factors are important correlates of dietary pattern in overweight adults. *J Cardiovasc Nurs*. 2010; 25: 450-460.
14. Appleton KM, Woodside JV, Yarnell JWG. Depressed mood and dietary fish intake: Direct relationship or indirect relationship as a result of diet and lifestyle? *J Affect Disord*. 2007; 104: 217-223.
15. Akbaraly TN, Sabia S, Shipley MJ, Batty GD, Kivimaki M. Adherence to healthy dietary guidelines and future depressive symptoms: evidence to sex differentials in the Whitehall II study. *Am J Clin Nutr*. 2013; 97: 419-427.
16. Akbaraly TN. Dietary pattern and depressive symptoms in middle age. *Br. J. Psychiatry*. 2009; 195: 408-413.
17. Murakami K, Mizoue T, Sasaki S, Ohta M, Sato M, Matsushita Y et al. Dietary intake of folate, other B vitamins, and ω -3 polyunsaturated fatty acids in relation to depressive symptoms in Japanese adults. *Nutr*. 2008; 24: 140-147.
18. Young SN. Folate and depression-a neglected problem. *J Psychiatry Neurosci*. 2007; 32: 80-82.
19. Abou-Saleh MT, Coppen A. Folic acid and the treatment of depression. *J Psychosom Res*. 2006; 61: 285-287.
20. Jarosz M. Revised dietary norms for the Polish population. Warsaw: Institute of Food and Nutrition; 2012.
21. Lakhan SE, Vieira KF. Nutritional therapies for mental disorders. *Nutr J*. 2008; 7: 1-8.
22. Peet M.. Eicosapentaenoic acid in the treatment of schizophrenia and depression: rationale and preliminary double-blind clinical trial results. *Prostaglandins, Leukotrienes and Essential Fatty Acids*. 2003; 69: 477-485.