

## Characteristics of Social-Psychological Adaptation and Self-Regulation in Patients With Diabetes Mellitus

Nadezhda A. Tsvetkova<sup>a</sup>, Marina I. Aleksandrova<sup>b</sup>, Anna Igorevna Rybakova<sup>a</sup>, Larisa I. Starovoitova<sup>a</sup>, Tatiana B. Kononova<sup>a</sup>

<sup>a</sup>Russian State Social University,

<sup>b</sup>State healthcare institution "Pskov city polyclinic №2"  
RUSSIA

### ABSTRACT

The article presents the results of searching for answers to the following questions: which are the characteristics of socio-psychological adaptation and self-regulation behavior in patients with diabetes mellitus type II? What is the nature of the relationship between these personal characteristics? In particular, it contains results of comparative analysis of data experimental group (men and women, patients with diabetes mellitus type II) and control groups (men and women without a diagnosis "diabetes mellitus") by four parameters: 1) level of socio-psychological adaptation; 2) emotional modality; 3) the level of self-regulation of behavior; 4) peculiarities of self-regulation of behavior in conflict situations; and the results of the comparative analysis on the basis of gender. It is concluded that the level of socio-psychological adaptation and the level of self-regulation of behavior of patients with DM had significantly lower levels of socio-psychological adaptation and self-regulation of behavior of people without the diagnosis of "diabetes"; the higher the level of self-regulation of behavior of patients with DM, the higher the level of socio-psychological adaptation and Vice versa. The necessity of approximation programs of the courses in "Schools of diabetes" and other forms of group work with patients with diabetes to their ontological reality, i.e. taking into account the socio-psychological background of diabetes mellitus (personality characteristics, adaptation, self-regulation of behavior diabetics) and integration of medical, psychological and social assistance to this population.

### KEYWORDS

diabetes mellitus, socio-psychological adaptation, emotional modality, the self-regulation of behavior, style of self-regulation of behavior, the strategy of behavior in conflict, features of adaptation and self-regulation of patients with diabetes mellitus.

### ARTICLE HISTORY

Received 21 May 2016  
Revised 11 July 2016  
Accepted 11 July 2016

## 1. Introduction

### 1.1. Introduction to the problem

### CORRESPONDENCE

Anna Igorevna Rybakova

✉ Email: rybakovaai@rgsu.net

© 2016 The Author(s). Open Access terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>) apply. The license permits unrestricted use, distribution, and reproduction in any medium, on the condition that users give exact credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if they made any changes.

Diabetes mellitus (DM) is defined by World Health Organization (WHO) as an epidemic of a certain non-infectious disease, which is rapidly spreading on the Earth and is characterized by early disablement and mortality from the vascular complications.

From the two main types of diabetes, type I is more common in children and young people (it requires insulin injections). Type II DM is more common among adult population over 40 years old. This type of DM develops gradually and often stays in latent form; it is usually regulated by a diet, physical exercise and medicine in form of pills, while the insulin injections are unnecessary in most cases.

According to the data of the State registry, by 1st of January 2014 there are 3 964 889 people with registered DM in Russia. Moreover, there are 3 625 529 people with type II diabetes, among which 409 children, 342 adolescents and 3 624 778 adults.

Psychological approach towards studying diabetes in Russia began to develop in the 50s of the XX century, when R.A. Luria's work "Internal picture of disease and iatrogenic diseases" was published in 1935 [Luria, 1977]. In 1958 T.A. Nevzorova [Nevzorova, 1958] noted a typical psychological trait of patients with DM: gradually increasing state of depression, which is accompanied by anxiety and fear for the future, which might be replaced by uplifted mood, talkativeness or even chattiness.

In 1962 G.A. Rotshteyn [Rotshteyn, 1961] described mental disorders in DM – irritability, nervousness, rapid mood changes and high fatigability and headaches, depressive states, periods of increased appetite and thirst. On the later stages of the disease (more often in men than in women) there is decreased libido; a person might experience a feeling of offense, pity of oneself, apathy, despair and feeling of unhappiness. The main factors, which lead to the occurrence of diabetes, usually include: genetic predisposition towards this disease, excessive weight, low level of physical activity (people rarely walk and do not exercise regularly), bad eating (excessive consumption of sweet and fatty foods) and unhealthy lifestyle in general. Currently this unhealthy lifestyle is combined with conflict family relationships (Russia has the leading position in the amount of divorces) and increased psychological and emotional tension in relation to social-political cataclysms. The medical statistics is also "spoiled" by the tendency for aging of the society.

In XXI century scientific research of personal traits, self-attitude, interpersonal interactions and social-psychological adaptation of patients with DM are still conducted. For example, it has been established that DM patients have lower stress-resistance level, however, the more developed coping mechanisms a DM patient has, the more his "Self"-functions structure (by G. Ammon) is similar to such structure in healthy people. The studies proved a significant positive correlation of glycemic control with high quality of life in patients, as well as with ergopathic attitude to the disease, which reflects a person's orientation towards an active life, which leads to the decrease of

subjective significance of the disease and at the same time allows controlling it [Kudryavtseva & Ershova, 2014]. There are also differences in the field of psychogenic feelings in men and women. Four psychological crises were revealed and described: crisis of the reaction to diagnosis; crisis of insulin therapy prescription; crisis of complications development; and crisis caused by inpatient treatment and interaction with more “experienced” patients [Korkina & Elfimova, 2004]. However, there are still no data about specific personal traits in patients with DM, which make them significantly different from people without this diagnosis; despite that, the differences in separate parameters are still being accumulated. It is also necessary in order to optimize social-psychological prophylactics of this disease.

### 1.2. Significance of the problem

Currently diabetes is one of the socially significant diseases, along with tuberculosis, hepatitis, sexually-transmitted diseases, etc., which create the problem of decreasing the losses.

And while at present moment many medical problems related to treating diabetes are solved (therapeutic measures for all DM complications have been developed and the patients are taught to manage it), multiple studies that we conducted [Aleksandrova, 2011; Aleksandrova & Tsvetkova, 2012] show that this social category needs psychological assistance along with the medical one. In real life people with diabetes still need to pay the “price” of their disease daily in various fields of life. Moreover, there are significantly more women with diabetes than men, and for women diabetes means complicated pregnancy process and maternity self-realization.

It is also necessary to point out that the majority of studies of personality traits in people with DM are conducted by doctors, i.e. from the medical approach position. As we see it, psychologists are able to make an equally significant contribution to understanding and solving this problem. For example, it might include the search of a personality’s psychological resources, which would be activated in the process of teaching DM patients in “School of diabetes” and would allow increasing the level of their social-psychological adaptation and optimize their emotional field, which is often disordered, according to the studies [Valieva, 2014]. Taking these points in account, in present work we made an attempt to explore the characteristics of social-psychological adaptation in patients with diabetes in the relation to the specifics of their behavioral self-regulation, which has not yet been studied either in medicine or in psychology.

Scientific theoretical basis of our study contains the works in the following directions:

- 1) Diabetes mellitus as a global non-infectious epidemic and an acute social problem [Emelyanov, 2008; Melnikova, 2008; Galstyan, 2009; Suntsov et al., 2011 and other studies];
- 2) Psychological aspects of diabetes mellitus [Luria, 1977; Nevzorova, 1958; Lawson, 1993; Sidorov et al., 2000; Melnikova et al., 2002; Manukhina, 2003; Korkina & Elfimova, 2004; Shishkova, 2010; Nikolskaya & Kolomiets, 2011; Pozdnyakov, 2011; Motovilin et al., 2015 and other studies];
- 3) Studies of psychological traits of patients with DM [Sidorov et al., 2000; Surkova et al., 2001; Hait et al., 2002; Antsiferov et al., 2002; Korkina & Elfimova,

2004; Kovalev & Zelenin, 2011; Valieva, 2014; Motovilin et al., 2015; Rybakova, 2014; Bonkalo et al., 2015 and other studies];

4) Studies of the problems of DM patients' social-psychological adaptation and rehabilitation [Sidorov et al., 1998; Sidorov, 2006; Aleksandrova, 2012; Aleksandrova & Tsvetkova, 2012; Kudryavtseva & Ershova, 2014; Tsvetkova et al., 2015; Kozjakov et al. 2015 and other studies];

5) Social-psychological aspects of regulating diabetes mellitus [Surkova et al., 2000; Melnikova et al., 2002; Dedov, 2004; Mulkova, 2006; Bardymova, 2007; Ametov et al., 2009; Dedov & Shestakov, 2011; Aleksandrova & Tsvetkova, 2012 and other studies].

The aim of our study is to reveal the nature of the connection between social-psychological adaptation and behavioral self-regulation in diabetes mellitus patients.

Tasks of the study: 1) to diagnose social-psychological adaptation in diabetes patients upon the following parameters: adaptation, acceptance, self-acceptance, emotional comfort, internality, tendency to dominate, deceit, escapism; and to define the patients' SPA level; 2) to reveal the leading emotional modality in diabetes patients, the intensity and frequency of their experience of joy, anger, fear and sadness; 3) to diagnose the behavioral self-regulation style in DM patients by defining the level of development of four vitally significant abilities (planning, modelling, programming and results evaluation) and two vitally significant personal qualities (flexibility and independence); 4) to define the most preferred behavioral strategies in a conflict; 5) to conduct comparative analysis of the data of the experimental group (diabetes mellitus patients) and control group (people without the diagnosis "diabetes mellitus") and by gender.

### 1.3. Description of the study

Overall subject sample of the study included 128 people 35 to 55 years old (mean age – 52 years old), employed in the field of professional labor. The sample was divided into two groups: 1) people with type II diabetes mellitus – 64 people (32 men and 32 women with the duration of the disease from 1 to 20 years); 2) "healthy" people, i.e. people without the DM diagnosis – 64 people (32 men and 32 women).

### 1.4. Hypotheses of the study

The study is based on the hypotheses that: 1) the level of social-psychological adaptation and the level of behavioral self-regulation in patients with DM are significantly lower than the level of social-psychological adaptation and the level of behavioral self-regulation in people without the DM diagnosis; 2) the higher the level of behavioral self-regulation level in patients with DM, the higher the level of their social-psychological adaptation, and vice versa.

## 2. Methods

2.1 "Social-psychological adaptation" test by C. Rogers and R. Diamond, adapted by T.V. Snegireva [Fetiskin et al., 2002, pp. 193-197]. The method contains the following scales: adaptation, acceptance of others, self-acceptance, emotional comfort, internality, tendency to dominate; it generally allows evaluating subject's level of social-psychological adaptation as high, average or low.

2.2 Four-modality emotional questionnaire by L.A. Rabinovich [Ilyin, 2001, pp. 524-527]. The method contains the following scales: happiness, anger, fear, sadness. It allows revealing person's robust emotional experiences and tendency towards optimism or pessimism, towards positive or negative emotional background. It serves as an addition to the social-psychological adaptation test, because emotional modality is the most influential factor of person's adaptation.

2.3 "Behavioral self-regulation style" test by V.I. Morosanova (BSSM). The method reveals the capabilities to adapt to changing conditions and to compensate weak sides of the character by the means of conscious self-regulations. The questionnaire contains 7 scales (planning, modelling, programming, results evaluation, flexibility and independence) and allows constructing subject's individual self-regulation profile, which can be balanced or accentuated [Morosanova, 2004].

2.4 "Behavioral strategies in a conflict" questionnaire by K. Thomas. The method was introduced by K. Thomas in 1972; it consists of 36 pairs of statements, in each of which the respondent has to choose the one that better characterizes his behavior. It allows studying a person's main behavioral strategies in a conflict – competition, cooperation, compromise, avoidance or adaptation. The method was used as a supplement for the BSSM test because it was able to provide insights in the characteristics of the DM patients' behavioral self-regulation in conflict situations.

### 3. Results

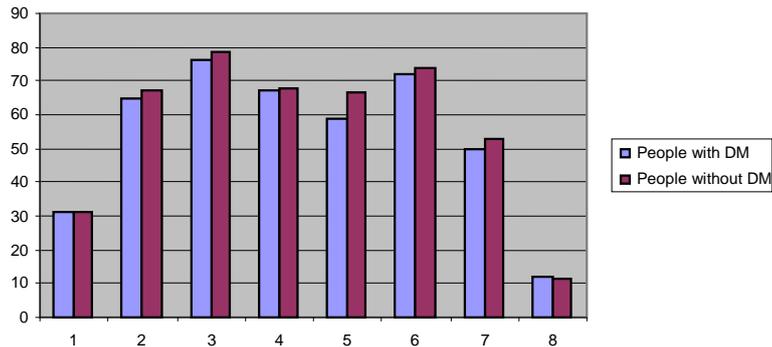
**3.1. Results of the Social-psychological adaptation test are presented in table 1 and picture 1.**

Table 1.

Overall sample distribution by the levels of social-psychological adaptation (people/% of the group in total)

Groups	Men and women (64 people) with type II DM			"Healthy" men and women (64 people)		
	Levels			Levels		
Social-psychological adaptation characteristics	High	High	High	High	Average	Low
1. Adaptation	7 (11%)	52 (81%)	5 (8%)	14 (22%)	48 (75%)	2 (3%)
2. Self-acceptance	33 (52%)	31 (48%)	0	44 (69%)	20 (31%)	0
3. Acceptance of others	12 (19%)	49 (77%)	3 (4%)	16 (25%)	46 (72%)	2 (3%)
4. Emotional comfort	8 (12%)	39 (61%)	17 (27%)	20 (31%)	35 (55%)	9 (14%)
5. Internality	26 (41%)	36 (56%)	2 (3%)	29 (45%)	35 (55%)	0

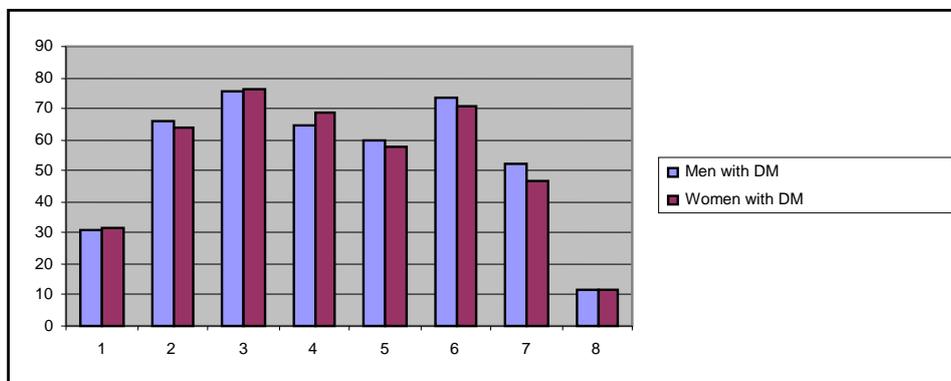
6. Dominance	2 (3%)	28 (44%)	34 (53%)	7 (11%)	27 (42%)	30 (47%)
7. Escapism	1 (2%)	40 (62%)	23 (36%)	3 (5%)	39 (61%)	22 (34%)
8. Deceit	11 (17%)	53 (83%)	0	13 (20%)	49 (77%)	2 (3%)



1 – deceit; 2 – adaptation; 3 – self-acceptance; 4 – acceptance of others; 5 – emotional comfort; 6 – internality; 7 – dominance; 8 – escapism

Picture 1. Levels of social-psychological adaptation characteristics in the group of people with DM and the group of “healthy” people.

We also compared the results of male and female samples of people with DM and obtained the following results, which are presented on picture 2.



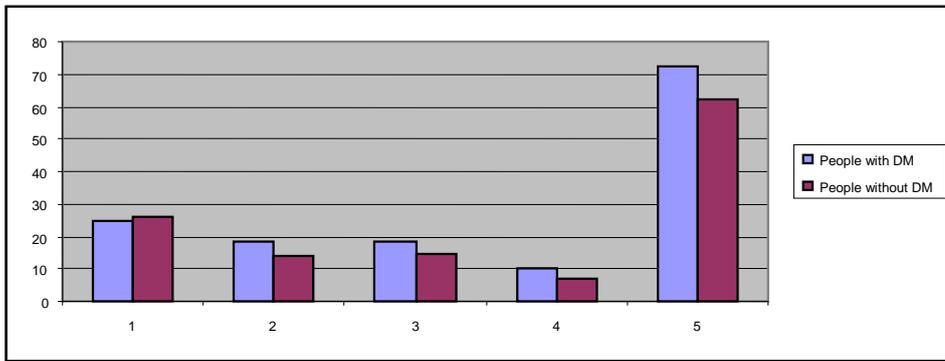
1 – deceit; 2 – adaptation; 3 – self-acceptance; 4 – acceptance of others; 5 – emotional comfort; 6 – internality; 7 – dominance; 8 – escapism

Picture 2. Levels of social-psychological adaptation characteristics in groups of men and women with DM

**3.2. The results obtained on the basis of four-modality emotional questionnaire by L.A. Rabinovich are presented in table 2 and picture 3.**

Table 2. Overall sample distribution by the levels of emotional modalities characteristics (people/% of the group in total)

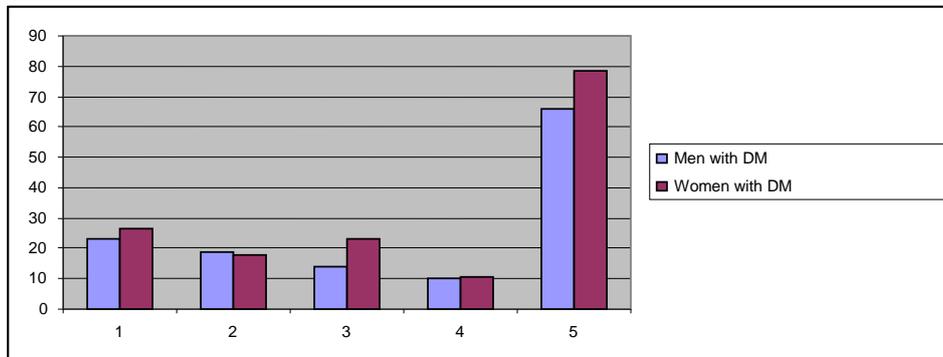
Groups	Men and women (64 people) with type II DM			“Healthy” men and women (64 people)		
	Levels			Levels		
Emotional modalities (from 0 to 48 points)	High (33-48 points)	Average (17-32 points)	Low (0-16 points)	High	Average	Low
1. Happiness	16 (25%)	35 (55%)	13 (20%)	18 (28%)	33 (52%)	13 (20%)
2. Anger	6 (9%)	29 (45%)	29 (45%)	2 (3%)	21 (33%)	41 (64%)
3. Fear	8 (12,5%)	27 (42%)	29 (45%)	1 (2%)	21 (33%)	42 (65%)
4. Sadness	2 (3%)	11 (17%)	51 (80%)	0	5 (8%)	59 (92%)



1 – happiness; 2 – anger; 3 – fear; 4 – sadness; 5 – general level of emotionality

Picture 3. Levels of emotional modalities characteristics in the group of people with DM and in the group of “healthy” people

We also compared the results of male and female samples of people with DM and obtained the following results, which are presented on picture 4.



1 – happiness; 2 – anger; 3 – fear; 4 – sadness; 5 – general level of emotionality

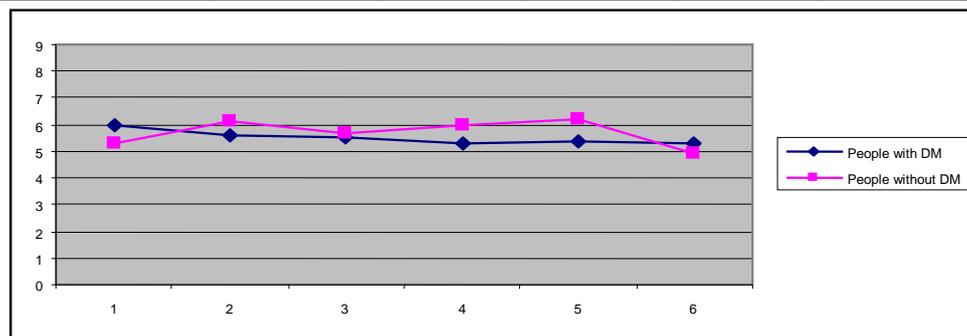
Picture 3. Levels of emotional modalities characteristics in men and women with DM (mean scores)

**3.3. The results of the Behavioral self-regulation style (BSSM) tests are presented in table 3 and pictures 5 and 6.**

Table 3.

Overall sample distribution upon the levels of behavioral self-regulation style characteristics (people/% of the group in total).

Groups	Men and women (64 people) with type II DM			“Healthy” men and women (64 people)		
	Levels			Levels		
Self-regulation characteristics (from 0 to 9 points = 54)	High (8-9 points)	Average (5-7 points)	Low (0-4 points)	High	Average	Low
1. Planning	15 (23%)	33 (50%)	16 (25%)	10 (16%)	32 (50%)	22 (34%)
2. Modelling	7 (11%)	42 (66%)	15 (23%)	16 (25%)	35 (55%)	13 (20%)
3. Programming	9 (14%)	36 (56%)	19 (30%)	7 (11%)	42 (66%)	15 (23%)
4 Results evalutaion	8 (13%)	33 (51%)	23 (36%)	12 (19%)	42 (66%)	10 (15%)
5. Flexibility	8 (13%)	34 (53%)	22 (34%)	19 (30%)	32 (50%)	13 (20%)
6. Independence	9 (14%)	32 (50%)	23 (36%)	10 (16%)	23 (36%)	31 (48%)

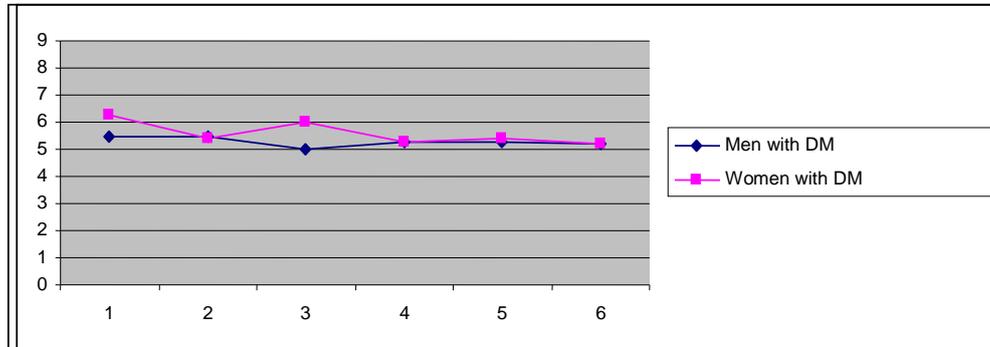


1 – planning; 2 – modelling; 3 – programming; 4 – results evaluation; 5 – flexibility; 6 – independence

Picture 5. Levels of behavioral self-regulation style characteristics in the group of people with DM and in the group of “healthy” people



We also compared the results of male and female samples of people with DM and obtained the following results, which are presented on picture 6.



1 - planning; 2 - modelling; 3 - programming; 4 - results evaluation; 5 - flexibility; 6 - independence

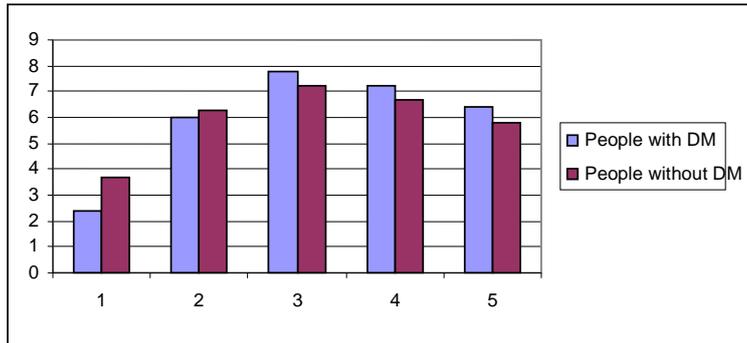
Picture 6. Levels of behavioral self-regulation style characteristics in the groups of men and women with DM (mean scores)

3.4 The results of Behavioral strategies in a conflict test by K. Thomas are presented in table 4 and picture 7.

Table 4.

Overall sample distribution depending on the level of manifestation of the behavioral strategies in a conflict situation (people/% of the group in general)

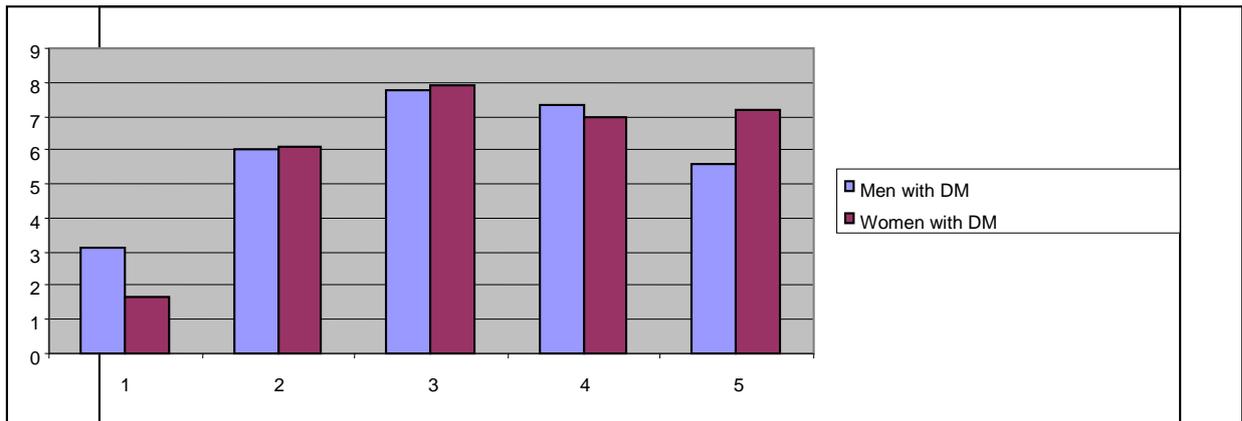
Groups	Men and women (64 people) with type II DM			"Healthy" men and women (64 people)		
	Levels			Levels		
Behavioral strategies in a conflict situation	High	Average (5-7 points)	Low	High	Average	Low
1. Competition	4 (6%)	6 (9%)	54 (85%)	11 (17%)	13 (20%)	40 (63%)
2. Cooperation	14 (22%)	41 (64%)	9 (14%)	15 (23%)	40 (63%)	9 (14%)
3. Compromise	38 (59%)	24 (38%)	2 (3%)	30 (47%)	32 (50%)	2 (3%)
4. Avoidance	30 (47%)	28 (44%)	6 (9%)	22 (34%)	32 (50%)	10 (16%)
5. Adaptation	18 (28%)	33 (52%)	13 (20%)	16 (25%)	31 (48%)	17 (27%)



1 – competition; 2 – cooperation; 3 – compromise; 4 – avoidance; 5 - adaptation

Picture 7. Level of manifestation of preferred behavioral strategies in a conflict situation in the group of people with DM and in the group of “healthy” people

We also compared the results of male and female samples of people with DM and obtained the following results, which are presented on picture 8.



1 - competition; 2 - cooperation; 3 - compromise; 4 - avoidance; 5 - adaptation

Picture 8. Level of manifestation of preferred behavioral strategies in a conflict situation in the groups of men and women with DM (mean scores)

The results obtained by the separate methods are presented in an overall table 5.



Table 5.

Overall table of the results of the study (mean scores of the groups)

Parameters and characteristics	Compared groups		Compared groups	
	Men and women (64 people) with type II DM	“Healthy” men and women (64 people)	Men with type II DM	Women with type II DM
1. Social-psychological adaptation:				
- deceit	31,3	31,0	30,7	31,8
- adaptation	64,9	67,5	66,0	63,9
- self-acceptance	76,1	78,7	75,9	76,3
- acceptance of others	67,0	67,6	64,8	69,0
- emotional comfort	58,9	66,7	60,0	57,7
- internality	72,2	73,8	73,5	70,9
- dominance	49,8	53,1	52,4	47,0
- escapism	12,0	11,2	11,5	11,9
2. Emotional modalities:				
- Happiness	24,9	26,1	23,0	26,6
- Anger	18,7	13,9	19,0	18,0
- Fear	18,6	14,8	14,0	23,1
- Sadness	10,2	7,3	10,0	10,6
- Levels of emotionality	72,4	62,1	66,0	78,3
3. Behavioral self-regulation style:				
- Planning	6,0	5,3	5,5	6,3
- Modelling	5,6	6,1	5,5	5,4
- Programming	5,5	5,7	5,0	6,0
- Results evaluation	5,3	6,0	5,3	5,3
- Flexibility	5,4	6,2	5,3	5,4
- Independence	5,3	4,9	5,2	5,2

- General level of self-regulation	33,1	34,2	32,4	33,6
4. Behavioral strategies in a conflict:				
- Competition	2,4	3,7	3,1	1,7
- Cooperation	6,0	6,3	6,0	6,1
- Compromise	7,8	7,2	7,8	7,9
- Avoidance	7,2	6,7	7,3	7,0
- Adaptation	6,4	5,8	5,6	7,2

The following results were obtained:

1. During the comparison of social-psychological adaptation characteristics in the group of people with DM and group of “healthy” people we revealed that low level of adaptation and emotional comfort is significantly more frequent in men and women with DM ( $\varphi^* = 1.8$  and  $2.6$  with  $p = 0.036$  and  $0.003$  correspondingly).

High level of self-acceptance is more frequent in the group of “healthy” people, whereas for the group of people with DM it is the average level ( $\varphi^* = 2.79$  and  $2.78$  with  $p = 0.002$ ). High level of dominance is significantly more frequent in “healthy” people ( $\varphi^* = 2.61$ ;  $p = 0.003$ ). Internality is also higher in “healthy” people, whereas deceit – in people with DM (for both characteristics  $\varphi^* = 2.77$ ;  $p = 0.002$ ).

2. During the comparison of emotional modalities characteristics we revealed the differences on the following scales: anger ( $t = 2.834$ ;  $p = 0.006$ ), fear ( $t = 2.831$ ,  $p = 0.006$ ) and sadness ( $t = 2.080$ ,  $p = 0.042$ ). All characteristics have higher level in people with DM.

Comparison of the emotional modalities levels revealed the most significant differences on the sadness scale: it is significantly different on all three levels ( $\varphi^* = 2.77$ ,  $2.20$  and  $2.82$ ;  $p = 0.002$ ;  $0.014$  and  $0.001$ ) with the predominance of generally higher level of sadness in people with DM. High and average levels of anger are more common in the group of people with DM ( $\varphi^* = 2.08$  and  $1.97$ ;  $p = 0.018$  and  $0.024$ ), whereas the low level is more common in the group of “healthy” people ( $\varphi^* = 3.06$ ;  $p = 0.000$ ). The fear characteristic does not have any significant differences in the frequency of the average level, however, high level of fear is significantly more frequent in people with DM and the low level – in the “healthy” people ( $\varphi^* = 3.50$  and  $3.22$ ;  $p = 0.000$ ).

3. The comparison of behavioral self-regulation style revealed the differences on the Flexibility scale: the frequencies are significantly different on all three levels ( $\varphi^* = 3.35$ ,  $2.74$  and  $2.53$ ;  $p = 0.000$ ,  $0.002$  and  $0.004$ ) with the dominance of the high flexibility level in the group of “healthy” people. The Results evaluation scale has significant differences in the frequency of average and low levels ( $\varphi^* = 2.44$  and  $3.92$ ;  $p = 0.006$  and  $0.000$ ) with the predominance of the low scores in people with DM. High level of Modelling characteristic is significantly more frequent in the group of “healthy” people, while the average – in the group of people with DM ( $\varphi^* = 2.96$  and  $1.80$ ;  $p = 0.000$  and  $p = 0.036$ ). Average level of Independence characteristic is significantly more frequent in people with DM ( $\varphi^* = 2.26$ ;  $p = 0.012$ ), while the low level – in “healthy” people ( $\varphi^* = 1.94$ ;  $p = 0.026$ ).

There is a tendency of polarized manifestation of Programming characteristics in people with DM; its average level is significantly more common in the group of “healthy” people ( $\varphi^* = 1.64$ ;  $p = 0.050$ ).

4. The comparison of behavioral strategies in a conflict revealed significant differences on the cooperation scale ( $t = -2.208$ ;  $p = 0.031$ ); it is more common for “healthy” people. The frequency of all three levels of the cooperation strategy is significantly different, but in general it is more common in “healthy” people ( $\varphi^* = 2.83, 2.77$  and  $4.08$ ;  $p = 0.001, 0.002$  and  $0.000$ ). High level of compromise is significantly more frequent in the group of people with DM ( $\varphi^* = 1.92$ ;  $p = 0.027$ ), while the average level – in the group of “healthy” people ( $\varphi^*$ ;  $p = 0.026$ ). High level of avoidance is also significantly more frequent in people with diabetes ( $\varphi^* = 2.12$ ;  $p = 0.017$ ) and the low level – in “healthy” people ( $\varphi^* = 1.71$ ;  $p = 0.044$ ).

In general, it is possible to conclude that: 1) people with DM have significantly lower level of social-psychological adaptation (they have lower adaptation, self-acceptance, emotional comfort, internality and dominance characteristics) in comparison with the “healthy” people; 2) people with DM have significantly lower level of behavioral self-regulation (they have lower levels of modelling, results evaluation and flexibility) than “healthy” people; exceptions are the characteristics of independence and planning, which are slightly higher in the group of people with DM than in the group of “healthy” people.

The comparison of social-psychological adaptation characteristics in the group of men and the group of women with DM, performed with Student’s t-test, revealed that:

1) The levels are significantly different for the following scales: acceptance of others, emotional comfort, internality and dominance ( $t = 2.001$ ;  $p = 0.054$ );

2) There are differences in emotional modalities on the scales of fear ( $t = 5.255$ ;  $p = 0.000$ ) and happiness;

3) Among the scales of behavioral self-regulation style the only significant difference is in the programming characteristic ( $t = 2.099$ ;  $p = 0.044$ ).

4) The comparison of the behavioral strategies in a conflict revealed significant differences on the scales of competition ( $t = -2.319$ ;  $p = 0.027$ ) and adaptation ( $t = 2.970$ ;  $p = 0.006$ ).

We would like to point out that the comparison of the results of “healthy” men and women revealed only one significant difference: on the fear scale ( $t = 6.287$ ;  $p = 0.000$ ), which means that women are much more prone to experiencing fear than men.

Correlation analysis of the data was performed by the method of Pearson linear correlation coefficient, which is used for studying the connection between metric variables, and Spearman rank correlation coefficient, which is used for studying the connection between rank and metric variables. The calculations were conducted with SPSS (v 13.0). We revealed the following correlations between the characteristics of social-psychological adaptation and the characteristics of behavioral self-regulation style:

1) In the group of people with DM, scale of lie correlates with the independence scale ( $r = 0.310$ ;  $p = 0.013$ ). In both groups, adaptation scale is related to the characteristics of modelling ( $r = 0.415$ ;  $p = 0.001$  and  $r = 0.384$ ;  $p = 0.003$

respectively), results evaluation ( $r = 0.342$ ;  $p = 0.006$  and  $r = 0.407$ ;  $p = 0.001$ ), flexibility ( $r = 0.436$ ;  $p = 0.000$  and  $r = 0.298$ ;  $p = 0.017$ ) and general level of self-regulation ( $r = 0.449$ ;  $p = 0.000$  and  $r = 0.312$ ;  $p = 0.012$ ). Moreover, we revealed the correlations with the programming variable ( $r = 0.297$ ;  $p = 0.025$ ) in the group of “healthy” people. Therefore, the higher the adaptation levels, the higher the separate self-regulation characteristics in overall subject sample;

2) In both groups, self-acceptance characteristic correlates with the scales of flexibility ( $r = 0.331$ ;  $p = 0.008$  and  $r = 0.431$ ;  $p = 0.000$ , respectively) and general level of self-regulation ( $r = 0.300$ ;  $p = 0.016$  and  $r = 0.468$ ;  $p = 0.000$ , respectively). Additionally, we revealed the correlations that were present only in the group of people with DM – with the scales of modelling ( $r = 0.425$ ;  $p = 0.000$ ) and result evaluation ( $r = 0.420$ ;  $p = 0.001$ ). Therefore, the self-acceptance characteristic is specific for the studied groups: in the group of people with DM it is more tightly linked with separate self-regulation characteristics;

3) In both groups, the acceptance of others correlates with the scales of flexibility ( $r = 0.285$ ;  $p = 0.022$  and  $r = 0.395$ ;  $p = 0.001$ , respectively) and general level of self-regulation ( $r = 0.250$ ;  $p = 0.046$  and  $r = 0.282$ ;  $p = 0.024$ , respectively). Additionally, we revealed the correlations that were present only in the group of people with DM – with the scales of modelling ( $r = 0.306$ ;  $p = 0.014$ ) and independence ( $r = -0.249$ ;  $p = 0.047$ ), while in the group of “healthy” people we revealed a correlation with programming ( $r = 0.305$ ;  $p = 0.014$ ). Thus, the acceptance of others also is specific: in the group of people with DM it is more tightly related to the specific characteristics of self-regulation. People with DM also showed a negative correlation between the scales of “acceptance of others” and “independence”: the higher their level of acceptance of others, the lower their level of independence;

4) In both groups, emotional comfort characteristic is related to the characteristics of the scales of modelling ( $r = 0.357$ ;  $p = 0.004$  and  $r = 0.433$ ;  $p = 0.000$ , respectively), flexibility ( $r = 0.305$ ;  $p = 0.014$  and  $r = 0.371$ ;  $p = 0.003$ , respectively) and general level of self-regulation ( $r = 0.271$ ;  $p = 0.031$  and  $r = 0.418$ ;  $p = 0.001$ ). The group of people with DM additionally presented a correlation between emotional comfort scale with the results evaluation scale ( $r = 0.413$ ;  $p = 0.001$ );

5) In both groups, the internality scale level is related to the scales of modelling ( $r = 0.357$ ;  $p = 0.004$  and  $r = 0.534$ ;  $p = 0.000$ , respectively) and results evaluation ( $r = 0.289$ ;  $p = 0.020$  and  $r = 0.475$ ;  $p = 0.000$ ); flexibility ( $r = 0.403$ ;  $p = 0.001$  and  $r = 0.374$ ;  $p = 0.002$ ) and general level of self-regulation ( $r = 0.395$ ;  $p = 0.001$  and  $r = 0.514$ ;  $p = 0.000$ ). The group of people with DM additionally presented a correlation of the internality scale with the scales of planning ( $r = 0.277$ ;  $p = 0.027$ ) and programming ( $r = 0.304$ ;  $p = 0.015$ );

6) In both groups, the dominance scale is related to the flexibility scale ( $r = 0.433$ ;  $p = 0.000$  and  $r = 0.435$ ;  $p = 0.000$ , respectively) and the general level of self-regulation ( $r = 0.363$ ;  $p = 0.003$  and  $r = 0.381$ ;  $p = 0.002$ ). In the group of people with DM we revealed a correlation of the dominance scale with the modelling scale ( $r = 0.336$ ;  $p = 0.007$ ); in the group of “healthy” people – with the independence scale ( $r = 0.297$ ;  $p = 0.017$ );

7) In both groups we revealed one common correlation of the escapism scale with the modelling scale ( $r = 0.396$ ;  $p = 0.001$  and  $r = 0.261$ ;  $p = 0.037$ ). In the group of people with DM escapism also correlates with the following scales of

behavioral self-regulation style: results evaluation ( $r = -0.334$ ;  $p = 0.007$ ), flexibility ( $r = -0.327$ ;  $p = 0.008$ ), independence ( $r = 0.370$ ;  $p = 0.003$ ) and general level of behavioral self-regulation ( $r = -0.271$ ;  $p = 0.030$ ).

Therefore, correlation analysis showed that separate characteristics of social-psychological adaptation are tightly related to the separate characteristics of self-regulation; furthermore, these correlations are wider in people with diabetes. In the sense of revealing differences, such scales of social-psychological adaptation, as self-acceptance, acceptance of others, internality and escapism, are especially significant.

#### 4. Discussion

The obtained results allow discussing the following conclusions:

1. Men and women with type II DM have significantly lower levels of the majority social-psychological adaptation parameters (adaptation, self-acceptance, emotional comfort, internality and dominance) in comparison with men and women without this diagnosis. Moreover, men with DM, compared with women with DM, have higher level of adaptation, emotional comfort, internality and dominance, while women, compared with men, have higher level of deceit and acceptance of others. Therefore, women with DM are less socially-psychological adapted than men.

2. Men and women with type II DM significantly differ in emotionality level from men and women without this disease: general level of emotionality is significantly higher in people with DM, whereas the positive component (modality of happiness) is presented less but the negative components (modalities of anger, fear and sadness) are presented more. Furthermore, men with DM, compared with women with DM, have higher level of anger, and women, compared with men, have higher level of happiness, fear and emotionality in general.

3. Men and women with type II DM differ from men and women without this disease in the levels of behavioral self-regulation: these levels are lower in people with diabetes, despite the fact that it can be characterized as balanced (see picture 5), because the difference between its components is not significant (minimal mean score – 5.3; maximal – 6.0). Moreover, the largest differences between “sick” and “healthy” people are observed for the characteristics of planning, modelling, results evaluation and flexibility. We would like to point out that in the independence characteristic people with diabetes are slightly higher than “healthy” people. Furthermore, women with DM, compared with men with DM, have higher general level of behavioral self-regulation and such parameters, as planning and programming.

Therefore, we can consider low levels of behavioral self-regulation style as unused personality resources of people with diabetes and stimulate them to develop.

4. Optimal behavioral strategy in a conflict is considered the one that uses all five behavioral tactics (competition, cooperation, compromise, avoidance and adaptation) and each of them has a score between 5 and 7 points. The result of people with DM is more different from the optimal one than the result of “healthy” people, because in people with DM the competition scale has a score less than 5 points and other two (compromise and avoidance) – more than 7 points.

There are gender differences in the preferred behavioral style in conflict situations: in comparison to women, men are more prone to competition and less

– to adaptation. In general, men and women with DM avoid competition (score less than 5) and prefer compromise (score more than 7); however, men focus on compromise and avoidance (score more than 7), while women – on compromise and adaptation.

According to these data, it is reasonable to assist people with diabetes with optimizing their behavior in a conflict by teaching them to use the tactics with higher scores less often and the tactics with lower scores – more often.

5. The revealed and presented above social-psychological traits, which characterize people with DM, compared to “healthy” people, including the differences between men and women with this disease, have to be considered in the process of professional interaction with this social category. While working with patients with type II DM, it is reasonable to use the programs aimed at optimizing the level of their social-psychological adaptation (increasing the level of emotional comfort, in particular); emotional modalities (decreasing the intensity and frequency of feeling negative emotions); behavior in a conflict (learning a strategy of competition, developing assertiveness in behavior); and behavioral self-regulation (increasing its general level through increasing each of the structural components – planning, programming, modelling, results evaluation, flexibility and independence).

### 5. Conclusion

The obtained results in general allow concluding that the hypotheses, proposed at the beginning of the study, have been confirmed: it was established that the level of social-psychological adaptation and the level of behavioral self-regulation in patients with DM are significantly lower than the level of social-psychological adaptation and the level of behavioral self-regulation in people without this diagnosis. Moreover, the nature of the correlation between social-psychological adaptation and behavioral self-regulation in people with diabetes mellitus is the following: the higher the level of behavioral self-regulation in patients with DM, the higher the level of their social-psychological adaptation, and vice versa. The obtained data mean that:

- by teaching patients with DM to plan, program, model and evaluate results, we increase the level of their vital abilities development, which lie in the basis of successful activity and adaptive behavior;

- by developing their flexibility and independence (vitaly significant personality qualities), we facilitate the increase of the general level of conscious behavioral self-regulation, which ultimately leads to the increase in the level of social-psychological adaptation.

However, it is important to understand that on the current level of social development diabetes mellitus is, unfortunately, incurable by neither medical, nor psychological, nor any other means. This means that a person, who became sick with it, has to understand and accept that he has this disease, he has to consider it and do everything that allows maintaining or even improving quality of life. In order to make this strategy of professional social-medical assistance of people with DM possible, it has to be supplemented with specially developed social-psychological model of professional interaction with this social category, which can be used, for example, within the “School of diabetes”.

Evaluating the perspective of further psychological studies of the diabetes mellitus problem, we would like to point out that the problem of integrating

medical, psychological and social assistance of patients with DM has not been solved yet; there are almost no scientific developments in such aspect as social-psychological prophylactics of diabetes mellitus; further studies of social-psychological personality characteristics of people with DM, including gender analysis, are possible.

Obviously, currently there is a need not only in the solidarity of the participants of the fight against diabetes (the patients themselves, their relatives and close ones, endocrinologists and social workers), but also in consideration of social-psychological bases of diabetes mellitus (personality characteristics, adaptation and self-regulation of the behavior of people with diabetes). This would help making the programs of the “School of diabetes” courses and other forms of group work with patients with DM and people with predisposition towards this disease closer to their ontological reality.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### References

- Aleksandrova, M.I. (2011). Sotsialno-psikhologicheskie problemy bolnykh sakharnym diabetom. [Social-psychological problems of patients with diabetes mellitus]. *Vestnik universiteta (Gosudarstvennyi universitet upravleniya)*, 20, pp. 4-5.
- Aleksandrova, M.I. (2012). Integratsiya meditsinskoy, sotsialnoy i psikhologicheskoy pomoschi bolnym sakharnym diabetom kak aktualnaya problema. [Integration of medical, social and psychological assistance for patients with diabetes mellitus as a significant problem]. VIII Mezhdunarodnaya nauchnaya konferentsiya: Sb. dokladov. RF, g. Lipetsk, 24 dekabrya 2011 g., Lipetsk: ITS “Gravis”, pp. 203-209.
- Aleksandrova, M.I., Tsvetkova, N.A. (2012). Organizatsiya sotsialno-psikhologicheskogo obsluzhivaniya bolnykh sakharnym diabetom. [Organization of social-psychological services for patients with diabetes mellitus]. *Vestnik Mordovskogo universiteta*, 1, pp. 53-58.
- Aleksandrova, M.I., Tsvetkova, N.A. (2012). Osobennosti sotsialno-psikhologicheskoy adaptatsii zhenshin, bolnykh sakharnym diabetom. [Characteristics of social-psychological adaptation in women with diabetes mellitus]. *Sotsialnaya politika i sotsiologiya*, 3(81), pp. 91-98.
- Ametov, A.S., Karpova, E.V., Ivanova, E.V. (2009). Effektivnoe i bezopasnoe upravlenie sakharnym diabetom 2 tipa na sovremennom urovne. [Efficient and safe regulation of type 2 diabetes mellitus on the current level]. *Dokazatel'naya diabetologiya*, 2, pp. 18-24.
- Antsiferov, M.B., Drobizhev, M.Yu., Surkova, E.V., Zakharchuk, T.A., Melnikova, O.G. (2002). Lokus kontrolya u bolnykh sakharnym diabetom. Obyektivnaya otsenka subyektivnogo otnosheniya k lecheniyu. [Locus of control in patients with diabetes mellitus. Objective evaluation of subjective attitude towards treatment]. *Problemy endokrinologii*, 48(4), pp. 23-27.
- Bardymova, E.V. (2007). Sovremennye aspekty profilaktiki sakharnogo diabeta 2 tipa. [Modern aspects of type 2 diabetes mellitus prophylactics]. *Sibirskiy meditsinskiy zhurnal*, 6, pp. 34-37.
- Bonkalo, T.I., Rybakova, A.I., Bonkalo, S.V., Belyakova, N.V., Gorohova, I.V. (2015). Social and psychological provisions for actualization of the professional self-identity of teenagers with disabilities in conditions of the inclusive education. *Biosciences Biotechnology Research Asia*, 12(3), pp. 2525-2534.
- Feriskin, N.P., Kozlov, V.V., Manuylov, G.M. (2002). Sotsialno-psikhologicheskaya diagnostika lichnosti i mal'nykh grupp. [Social-psychological diagnostics of personality and small groups]. M.: Institut Psikhoterapii, 490 p.
- Galstyan, G.R. (2009). 69-ya Nauchnaya sessiya Amerikanskoy Diabeticheskoy Assotsiatsii (ADA), 5-9 iyunya 2009 g., Novyi Orlean. [69<sup>th</sup> Scientific session of the American Association of Diabetes (AAD), 5-9 June 2009, New Orleans]. *Sakharnyi diabet*, 12(3), pp. 97-99.
- Ilyin, E.P. (2001). Emotsii i chuvstva. [Emotions and feelings]. SPb.: Piter, pp. 524-527.
- Khait, F.I., Manukhina, N.M. (2002). Lichnostnye osobennosti endokrinologicheskikh bolnykh v period obostreniya ikh khronicheskogo zabolevaniya. [Personality traits in endocrinology patients in the period of exacerbation of their chronic disease]. *Aspirant i soiskatel*, 6(13), pp. 171-178.
- Korkina, M.V., Elfimova, E.V. (2004). Psikhogenno-somatogennye vzaimootnosheniya pri sakharnom diabete. [Psychogenic-somatogenic relationships in diabetes mellitus]. *Zhurnal nevrologii i psikiatrii im. S.S. Korsakova*, 11, pp. 25-28.

- Kovalev, Yu.V., Zelenin, K.A. (2011). Sakharnyi diabet i trevozhnye rasstroystva. [Diabetes mellitus and anxiety disorders]. *Meditsinskaya psikhologiya v Rossii: elektronnyi nauchnyi zhurnal*, 5. Retrieved from: [http:// medpsy.ru](http://medpsy.ru).
- Kozjakov, R.V., Fomina, S.N., Rybakova, A.I., Sizikova, V.V., Petrova, E.A. (2015). Educating social-profile specialists for working with a family of a child with health limitations: competence approach. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 6(1), pp. 1852-1861.
- Kudryavtseva, S.V., Ershova, S.K. (2014). Sotsialno-psikhologicheskaya adaptatsiya bolnykh s insulinozavisimym sakharnym diabetom na sovremennom etape razvitiya meditsinskoy praktiki. [Social-psychological adaptation in patients with insulin-dependent diabetes mellitus on the current stage of medical practice development]. *Aktualnye problemy psikhosomatiki v obschemeditsinskoy praktike: Sb. statey*. (Ed. V.I. Mazurov). SPb.: Alta Astra, pp. 102-106.
- Lawson, M. (1993). Psikhologicheskie aspekty sakharnogo diabeta. [Psychological characteristics of diabetes mellitus]. *Diabet: obraz zhizni*, 2, pp. 15-17.
- Luria, R.A. (1977). Vnutrennyaya kartina bolezni i yatrogennye zabolevaniya. 4-e izdanie. [Internal picture of a disease and iatrogenic diseases. 4<sup>th</sup> edition]. M.: Meditsina, pp. 35-52.
- Manukhina, N.M. (2003). Sistema otnosheniy somaticheskikh bolnykh: na primere bolnykh endokrinnyimi zabolevaniyami. [Sistem of relationships in somatic patients: on the example of patients with endocrine diseases]. *Aspirant i soiskatel*, 1(14), pp. 144-154.
- Melnikova, O.G. (2008). Britanskoe prospektivnoe issledovanie sakharnogo diabeta (UKPDS): rezultaty 30-letnego nablyudeniya bolnykh sakharnym diabetom 2 tipa. [United Kingdom prospective diabetes study (UKPDS): results of 30-year observation of patients with type 2 diabetes mellitus]. *Sakharnyi diabet*, 11(4), pp. 90-91.
- Melnikova, O.G., Podmogaeva, E.A., Surkova, E.V., Kurtseva, T.G., Nikolaeva, V.V., Antsiferova, M.B. (2002). Obuchenie bolnykh sakharnym diabetom: psikhologicheskii analiz. [Educating patients with diabetes mellitus: psychological analysis]. *Sakharnyi diabet*, 5(4), pp. 60-64.
- Morosanova, V.I. (2004). Oprosnik "Stil samoreguluyatsii povedeniya". Psikhologicheskii instrumentariy. ["Behavioral self-regulation style" questionnaire. Psychological inventory]. M.: Kogito-Tsentr, 44 p.
- Motovilin, O.G., Shishkova, Yu.A., Surkova, E.V. (2015). Strategii sovladaniya (koping-strategii) u bolnykh sakharnym diabetom 1 i 2 tipa na insulinoterapii: svyaz s emotsionalnym blagopoluchiem i urovnem glikemicheskogo kontrolya. [Coping strategies in patients with type 1 and 2 diabetes mellitus on insulin therapy: correlation with emotional well-being and level of glycemic control]. *Sakharnyi diabet*, 18(4), pp. 41-48.
- Mulkova, N.N. (2006). Sotsialno-psikhologicheskie aspekty upravleniya sakharnym diabetom I tipa: Diss. ...kand. med. nauk. [Social-psychological aspects of regulating type I diabetes mellitus: Doctoral thesis in medical sciences]. Arkhangelsk: GOUVPO "Severnyi gos. meditsinskiy universitet", 175 p.
- Nevezorova, T.A. (1958). Psikhopatologiya v klinike vnutrennikh bolezney i neotlozhnaya pomoshch. [Psychopathology in clinic of internal diseases and emergency help]. M.: Meditsina, 224 p.
- Nikolskaya, I.M., Kolomiets, I.L. (2011). Uroven nevrotizatsii i stili sovladayushchego povedeniya materey detey, bolnykh sakharnym diabetom. [Level of neurotization and styles of coping behavior in mothers of children with diabetes mellitus]. *Rossiyskiy semeynyi vrach*, 15(2), pp. 40-45.
- Pozdnyakov, V.A. Psikhologicheskie prichiny vozniknoveniya sakharnogo diabeta. [Psychological reasons of diabetes mellitus development]. Retrieved from: [http://www.b17.ru/article/prichiny\\_diabeta](http://www.b17.ru/article/prichiny_diabeta)
- Psikhosomaticheskaya meditsina: Rukovodstvo dlya vrachey. [Psychosomatic medicine: Guidelines for doctors]. (2006). (Ed. P.I. Sidorov). M.: MEDpress-inform, 568 p.
- Rotshteyn, G.A. (1961). Ipokhondricheskaya shizofreniya. [Hypochondriac schizophrenia]. M.: Gosudarstvennyi nauchno-issledovatel'skii institut psikiatrii MZ RSFSR, 138 p.
- Rybakova, A.I. (2014). Psikhologicheskaya profilaktika suitsidalnykh proyavlenii. [Psychological prophylactics of suicidal manifestations]. *Sotsialno-psikhologicheskaya profilaktika i psikhoterapiya suitsidalnogo sostoyaniya lichnosti. III Vserossiyskaya nauchno-prakticheskaya konferentsiya*. (Scientific eds. E.A. Petrova & T.I. Bonkalo). Moscow: Akademiya imidzhologii, pp. 190-196.
- Shishkova, Yu.A. (2010). Klinicheskie, psikhologicheskie i sotsialno-demograficheskie aspekty kachestva zhizni u bolnykh sakharnym diabetom 1 tipa molodogo vozrasta. [Clinical, psychological and social-demographic aspects of quality of life in patients with type 1 diabetes of young age]. *Sakharnyi diabet*, 13(4), pp. 43-47.
- Sidorov, P.I., Novikova, I.A., Solovyev, A.G. (2000). Psikhicheskie izmeneniya i psikhologicheskie osobennosti bolnykh sakharnym diabetom. [Mental changes and psychological traits of patients with diabetes mellitus]. *Sotsialnaya i klinicheskaya psikiatriya*, 10(3), pp. 106-108.
- Sidorov, P.I., Pankov, M.N., Novikova, I.A. (1998). Psikhosotsialnaya reabilitatsiya bolnykh sakharnym diabetom. [Psychosocial rehabilitation of patients with diabetes mellitus]. *Problemy endokrinologii*, 4(6), pp. 19-22.



- Suntsov, Yu.I., Bolotskaya, L.L., Maslova, O.V. (2011). Epidemiologiya sakharnogo diabeta i prognoz ego rasprostranennosti v Rossiyskoy Federatsii. [Epidemiology of diabetes mellitus and prognosis of its spread in the Russian Federation]. *Sakharnyi diabet*, 14(1), pp. 15-19.
- Surkova, E.V., Antsiferov, M.B., Mayorov, A.Yu. (2000). Kachestvo zhizni kak vazhneyshii pokazatel effektivnosti lecheniya sakharnogo diabeta v XXI veke. [Quality of life as a significant parameter of diabetes mellitus treatment efficiency in the XXI century]. *Sakharnyi diabet*, 1, pp. 23-25.
- Surkova, E.V., Smirnov, S.D., Kornilova, T.V. (2001). Psikhologicheskie osobennosti bolnykh sakharnym diabetom tipa 2. [Psychological characteristics of patients with type 2 diabetes mellitus]. *Problemy endokrinologii*, 47(6), pp. 27-34.
- Terapevticheskoe obuchenie bolnykh sakharnym diabetom. [Therapeutic education of patients with diabetes mellitus]. (2004). (I.I. Dedov et al.). M.: "Reafarm", 200 p.
- Tsvetkova, N.A., Rybakova, A.I., Startseva, N.G. (2015). Psikhologicheskaya pomoshch lichnosti, perezvivayushey krizis starosti. [Psychological assistance for a person experiencing the old age crisis]. *Vestnik Moskovskogo gosudarstvennogo oblastnogo universiteta. Seriya: Psikhologicheskie nauki*, 4, pp. 27-27.
- Valieva, D.A. (2014). Psikhoeotsionalnye osobennosti patsientov s sakharnym diabetom. [Psychological and emotional characteristics of patients with diabetes mellitus]. *Vestnik sovremennoy klinicheskoy meditsiny*, 7, pp. 69-77.