

VILNIUS UNIVERSITY

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**QUALITY OF LIFE AND EMOTIONAL STATE RELATION TO SOCIAL
AND DISEASE FACTORS IN PATIENTS WITH TYPE 2 DIABETES**

Summary of the doctoral dissertation
Biomedical sciences, Public Health (10 B)

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VILNIAUS UNIVERSITETAS

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**SERGANČIŪJŲ 2-OJO TIPO CUKRINIŲ DIABETU GYVENIMO
KOKYBĖS IR EMOCINĖS BŪSENOS RYŠYS SU LIGOS IR
SOCIALINIAIS VEIKSNIAIS**

Daktaro disertacijos santrauka
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Abbreviations

\bar{x} – average

AH – arterial hypertension

BMI – body mass index

BP – bodily pain

CI – confidence intervals

df – number of degrees of freedom

DM – diabetes mellitus

ES – emotional state

GH – general health perceptions

HAD – Hospital anxiety and depression scale

Md – median

MH – mental health

OR_g – general odds ratio

OR_o – ordinary odds ratio

PF – physical functioning

PH – physical health

QL – quality of the life

RE – role limitations due to emotional problems

RP – role limitations due to physical health problems

SD – standard deviation

SF – social functioning

SF-36 – questionnaire of quality of the life (*Medical Outcomes Study 36-items Short Form*)

VT – vitality

WHO – World Health Organization

INTRODUCTION

1.1. Investigative problem and its relevance

The morbidity rate of diabetes mellitus (DM) is rapidly increasing both in the developed and developing countries of the world. The diabetes is diagnosed to 7 million people annually. Number of patients has increased more than two times during the last 15 years. According to information presented in the literature, number of patients can reach even 380 million till year 2025. About 5 percent of population has DM in Europe.

Agreeably to world tendency, number of patients with DM is increasing every year in Lithuania. According to data of Lithuanian Health Information Centre, in 2004 there were 19.7 of cases in the population group of 18 years and over for 1000 residents, and in 2008 – 25.1 of cases for 1000 residents, what makes 67 506.

Prevalence of the DM is relevant to obesity, insufficient physical activity, smoking, abundant use of alcohol. Type 2 diabetes is mostly typical to older age people. Type 2 diabetes disease is diagnosed to 65 years and older people 10 times more often than to younger than 45 year. Although the tendency is noticed that patients of type 2 diabetes mellitus are becoming younger.

Diabetes is a chronic incurable condition that influences life quality of patients. Those who have diabetes face different problems: including permanent use of medicines, insulin injections, fluctuations of the glucose level, changes of the health state, treatment of the nutrition and physical activity. Threatening complications of the acute and chronic diabetes undoubtedly make impact on the physiological wellness and patient's quality of the life (QL). Besides factors relevant to the condition, quality of the life is also influenced by: education, living conditions, accommodation, employment, material wellness, physical, mental health and social environment, level of independence, moral attitudes, personal and family life and etc. Health is one of the most important factors influencing quality of the life.

Diabetes, particularly its complications, not only cause impairment of the physical health, but at the same time promote occurrence of the psycho-emotional and social problems. After diagnosis of diabetes mellitus the person must change casual lifestyle, adapt to the new conditions of the life, he/she experiences a lot of negative emotions that cause lower social adaptation, decrease of efficiency and disability.

Not a few studies are performed about quality of the life and emotional state of patients with type 2 diabetes. Agreeably to these studies it was proved that diabetes has negative impact on quality of the life and emotional state of patients. Such data is presented by studies of quality of the life of patients with type 2 diabetes performed in USA, Holland, Estonia and other countries.

Accordingly to the data of the performed studies it was determined that patients with type 2 diabetes evaluate their physical health in much fewer points in compare with the persons who didn't have DM.

Different studies were performed and are performed in the number of countries all over the world in order to analyze influence of the different factors (disease, its duration, social factors, complications, treatment method, emotional state and etc.) on quality of the life and emotional state of patients.

Clinical state of type 2 diabetes, risk factors and quality of the life during determination of the disease were analyzed in Lithuania (Radzevičiene L., 2007). Also a survey of impairment of the DM nervous tissue and quality of the life of patients with type 2 diabetes was performed (Aglinskienė K, 2008). Relevance between emotional state, quality of the life and concentration of lipids, duration of the disease and used medicines of patients with type 2 diabetes was investigated (Lašaitė L. *et al.*, 2009).

Relation between quality of the life, emotional state of the patients with type 2 diabetes and factors of the disease (DM duration, complications, treatment method, hypertension, changes of nutritional habits and physical activity after determination of DM) and of the patient

(gender, age, body mass index (BMI), education, social group, marital state, harmful habits (smoking) wasn't studied. This induced us to perform this survey and in detail analyze influence of the disease (DM duration, complications, hypertension, changes of nutritional habits and physical activity after determination of DM) and patient (gender, age, body mass index (BMI), education, social group, marital state, harmful habits (smoking) to quality of the life and emotional state.

1.2. Purpose and task of the paper

Purpose of the paper – to determine relation between quality of the life, emotional state and disease and social factors of the patients with type 2 diabetes

Following tasks were defined in order to achieve purpose of the paper:

1. To evaluate relation between quality of the life and the factors of the patient: gender, body mass index, education, social group, marital status and some harmful habits.
2. To determined relation between quality of the life and the factors of the disease: duration of the diabetes, complications, treatment method, hypertension, changes of nutritional habits and physical activity after determination of DM.
3. To analyze relation between depression, anxiety and the factors of the patient: gender, body mass index, education, social group, marital status and some harmful habits.
4. To evaluate relation between depression, anxiety and the factors of the disease: duration of the diabetes, complications, treatment method, hypertension, changes of nutritional habits and physical activity after determination of DM.

1.3. Scientific novelty of the paper

Quality of the life and emotional state of patients with type 2 diabetes depending on the factors of the patient (gender, body mass index, education, social group, marital status and harmful habits (smoking) and on the factors of the disease (duration of the diabetes, complications, treatment method, hypertension, changes of nutritional habits and physical activity after determination of DM) was analyzed. Also relation between quality of the life and factors of the patient (gender, body mass index, education, social group, marital status and harmful habits (smoking) and the factors of the disease (duration of the diabetes, complications, treatment method, hypertension, changes of nutritional habits and physical activity after determination of DM) was evaluated. Relation between depression, anxiety and factors of the patient (gender, body mass index, education, social group, marital status and harmful habits (smoking) and factors of the disease (duration of the diabetes, complications, treatment method, hypertension, changes of nutritional habits and physical activity after determination of DM) was analyzed.

Performed detail study of quality of the life and emotional state of patients with type 2 diabetes allowed more broadly review influence of the different factors to quality of the life and emotional state.

This paper could be useful to specialists of the public health and health politics, while preparing and introducing DM preventive health programs in practice.

2. MATERIAL AND METHODS OF THE SURVEY

2.1. Sampling of the respondents

Patients for the survey were selected while applying **inclusion criterions:** 35 y. o. and > men and women, with type 2 diabetes, without any acute diseases during the survey. Patients satisfying **exclusion criterions:** younger than 35 years old, with type 1 diabetes, with acute diseases during the survey, weren't included in the survey.

2.2. Sample of the survey

Scale of answers in SF-36 questionnaire used for the evaluation of quality of the life (QL) is ordinal scale. For determination of the survey sample, asymmetry of the variables and QL fields was taken into consideration.

For determination of estimators for the calculation of the survey sample following Chebyshev inequality was used:

$$P \{ |\bar{y} - \mu| \leq E \} \geq 1 - \frac{\sigma^2}{nE^2},$$

where:

\bar{y} – average of the sample

μ – parameter (average)

σ^2 – dispersion

E - maximum bias

When $\sigma^2 = 20$, $E = 15\%$, $\alpha = 0.05$, size of the sample would be 890. In the case when it is expected that percent of non-answered forms would make 30, sample of the survey for the determination of estimators of the separate fields for quality of the life should be 1160.

In order to determine differences of estimators of the particular fields of quality of the life, following assumptions were applied for the calculation of the survey sample in the investigated groups: difference of averages of the estimators of quality of the life in the groups (group A and B) is equal 5, standard dispersion (σ) 20, effect level ($P(Y>X)$) 0.57, odds ratio (OR) 1.33, depending on the formula recommended by S. J. Walters:

$$n = \frac{6[z_{1-\alpha/2} + z_{1-\beta}]^2 / (\log \check{S}S)^2}{[1 - \sum_{i=1}^k \bar{\pi}_i^3]}$$

where $\bar{\pi}_i$ – is presumable part of the subjects in the groups A and B in each i category.

sample of the survey would consist of 584 subjects in one group (total sample for the comparison of two groups would make 1170 subjects).

For the research of relation between separate fields of quality of the life, depression, anxiety and factors of the patient and disease by logistic regression method, sample of the survey was calculated with statistics package *StudySize v.2.0.4*. (CreoStat HB 2001-2007). Following assumptions were applied for the calculation of sample of the survey: power of the survey is equal to 0.8, significant level – 0.05, multiple correlation coefficient – 0.1. If the presumable odds ratio would be 1.30, survey would include 2341 subject, and when OR is equal to 1.50, sample of the survey would reach 981.

2.3. Methods of the survey

Form consisting of three parts was prepared **for the survey**:

I part – independently prepared questions about the subjects of the survey: gender, age, weight, education, social and marital status, duration of the disease (in years), treatment method, complications, morbidity with arterial hypertension, if nutritional habits were changed after

diagnosis of diabetes (started to take nourishment accordingly to recommendations of the therapist); how often nourishment is taken accordingly to recommendations of the therapist; if after diagnosis of the diabetes exercising, sports are taken more often; if doing sports, exercises at least 2-3 times per week; do the subjects smoke.

Body mass index was calculated as relation between body mass kg and body height m square ($BMI=kg/m^2$).

II part – questionnaire of quality of the life SF-36 (*Medical Outcomes Study 36-items Short Form*).

III part – Hospital anxiety and depression (HAD) scale for the evaluation of the depressive state and anxiety.

SF-36 questionnaire. Quality of the life of patients was evaluated with SF-36 questionnaire. SF-36 questionnaire is designed to evaluate well being of the last four weeks. Answers presented to the questions are dichotomic and of Likert scale. This questionnaire consists of 36 questions that reflect eight fields of the life, related into two categories of the health – physical and mental health. **Following fields were used for the evaluation of the physical health (PH):** 1) **Physical functioning (PF)** – person's ability to perform casual physical actions); 2) **role limitations due to physical health problems (RP);** 3) **bodily pain (BP)** (its duration, intensity, impact on casual practice); 4) **general health perceptions (GH)** – it shows, how patient himself/herself evaluates his/her health. **Following fields were used for the evaluation of the mental health (MH):** 1) **vitality (VT)** – shows level of energy, freshness and fatigue); 2) **social functioning (SF)** – shows how health and emotional problems influences communication with relatives and friends); 3) **role limitations due to emotional problems (RE)** – shows influence of the emotional factors to work and other activity); 4) **emotional state (ES)** – shows different psychological states, especially anxiety and depression. For the evaluation of each field questions were used and answers to these questions were assessed in points, which sum can range from 0 to 100 points. The higher number of the points, the better is quality of the life.

Depression and anxiety states were evaluated by using Hospital anxiety and depression scale, which is broadly used for the selection of depression and anxiety disorders, designed to investigate the patients in general profile and specialized non-psychiatry medicine institutions. This scale was offered by English psychiatrists – A. S. Zigmont ir R. P. Snaith in 1983, and in 1991 this scale was translated into Lithuanian, published in the press and broadly used for the researches. HAD consists of instruction, how the form should be filled in and 14 statements: seven questions of the questionnaire are designed for anxiety symptoms and other seven statements – for the evaluation of depression symptoms. This scale allows investigating emotional state of the patient in a quick and detail way. Four answers (0–3) are presented for the each statement and the subject must choose the one that the most precisely reflects his/her self-feeling last week. Possible values are from 0 to 21 points both for depression and anxiety. Results for the depression and anxiety are summed up and evaluated separately: 0–7 points – there is no depression or anxiety; 8 points and over – there is a depression or anxiety. HAD scale isn't diagnostic instrument for psychical disorders; it just helps to sort patients who can have depression or anxiety disorders.

We analyzed the difference and the relation between quality of the life, emotional state (depressive state and anxiety) of patients with type 2 diabetes and factors of the patient (gender, age, BMI, education, social group, marital status, smoking) and factors of the disease (DM duration, complications, treatment method, hypertension, changes of nutritional habits and physical activity after determination of DM).

2.4. Course of the survey

After permission of the Lithuanian Bioethics Committee (2007-07-24, No. 28), in period of 2007–2010 an anonymous questionnaire survey was performed.

The questionnaire form was checked in the beginning of the survey by investigated 20 subjects with type 2 diabetes. The unclear questions were corrected.

Survey was performed in Antakalnis, Šeškinė, Karoliniškės Outpatient Clinics in Vilnius city; in Vilnius University Hospital Santariškės Clinics, Vilnius City University Hospital, Vilnius University Red Cross Hospital, Hospital of Panevėžys District. The subjects in Outpatient Clinics were questioned before or after visit in the therapist cabinet, and in the case of hospitals – in the wards during time free of procedures.

We performed the survey in compliance with the provisions the professional ethics of sociological-medical researches. In total 1500 forms were distributed during the total period of the survey. 1109 (73.93 percent) of forms were collected, 87 of them were filled in incompletely (recognized as unsuitable), the left 1022 were used in the research. In the majority cases (about 65 percent) forms of the survey were presented by the researcher herself, about 35 percent of the forms were distributed with help of care administrators of the health care institutions. Before presenting form of the survey, the subjects were acquainted with instruction for filling in the form, also verbal their agreement was received. After agreement to participate in the survey, the subjects filled in the forms by themselves.

We surveyed 1022 patients with type 2 diabetes (372 men and 650 women). The subjects were divided into **age groups**, by interval of 10 years: 35–44 y.o., 45–54 y.o., 55–64 y.o. and 65–74 y.o. The respondents were divided into four groups accordingly to **education level** of the subjects: elementary, incomplete secondary, secondary, vocational and higher education. Accordingly to marital state, patients with type 2 diabetes were divided in a following way: single, married, divorced and widow (widower). In order to evaluate **social position** of the subjects, they were divided into four groups: blue-collar workers, white-collar workers, pensioners and disabled.

The subjects were questioned about their weight and height. Respondents who weren't sure about own weight and height, were weighted and their height was measured in the health care institution, were survey was performed. Body mass index (**BMI**) was calculated as it is recommended by World Health Organization (WHO): too small body weight is when BMI is up to 18.4 kg/m², normal body weight is when BMI equals 18.5–24.9 kg/m², and overweight was determined when BMI was 25.0–29.9 kg/m², and obesity – when BMI ≥ 30 kg/m².

Accordingly to the **duration of the disease** patients were divided into four groups: patients with diabetes for the period up to 5 years, patients with DM for 6–10 years, patients with DM for 11–15 years and patients with DM for 16 years and over.

The subjects had to mark what DM complications were diagnosed for them. **We evaluated** distribution of the respondents accordingly to **following complications** of diabetes: nephropathy, retinopathy, angiopathy, polyneuropathy of legs. Also they were questioned if they have diagnosed arterial hypertension, do they use medicines for the treatment of hypertension. We composed separate groups of the subjects who had **arterial hypertension** and who weren't ill with this disease. Also the subjects were divided into the groups accordingly to their treatment method: only diet is prescribed, peroral (ingested) medicines are used, insulin is used and combinative therapy is prescribed – oral medicines and insulin are prescribed for the treatment. We studied **changes of the nutrition and physical activity** after diagnosis of DM. We chose **smoking** from the all harmful habits as results of the performed pilot research had shown that the subjects didn't answer to question about use of the alcohol. Smoking is the most harmful risk factor that causes pathology of the heart and blood-vessels, also morbidity with chronic non-infectious diseases, including type 2 DM.

2.5. Analysis of the data

Traditional descriptive and deductive statistic methods were used for the statistical analysis. Averages, medians, standard deviation (SD) were calculated for the general characteristics of the continuous variables. Distributions of the variables were analyzed by

Kolmogorov-Smirnov test and histogram. Frequency of the categorical data was evaluated in absolute numbers and percents, meanwhile ANOVA, Spearman correlation coefficient (r_s) were used for the comparison of the averages. If the variables hadn't satisfied assumptions of the normal distribution, correlation between such variables was analyzed by non-parametrical methods: Mann-Witney, Kruskal-Wallis test, Ksi-square criterions. Non-parametrical methods were used for the analysis of QL fields, are symmetry (negative) was found for the sub-scales.

Dependent variable of QL fields was transformed into dichotomical variable while using following criterion: average – 1 SD.

Logistic regression method was used for the evaluation of QL fields, relation between depression, anxiety and factors of the patient and disease. In order to evaluate number of the observations, cross tabulation was performed in the sub-groups (QL field and independent variable). In order to determine general relation between fields of QL and independent variable (gender, age, BMI, education, social group, marital state, smoking and etc.), one dimensional procedure of the logistical regression was performed and general odds ratio was calculated (OR_g). Hierarchical method was chosen for the composing of logistical regression model. The variables and their blocks were included gradually, while evaluating its (their) influence to dependable variable prognosis while comparing with the model, when earlier variables were used. While evaluating match between model and the data, model comparability χ^2 criterion (Omnibus test), Hosmer-Lemeshow test, classification table were used. Significance of β coefficient was evaluated by Wald test. Following methods were applied for the diagnostics of regression: residual analysis, Cook's distance, DFbeta (chosen criterion DFbeta>1), observation influence (h_i) index (chosen criterion: $h_i > 3(k+1)/n$), dispersion reduction factor VIF and proper values were used for the evaluation of colinearity (chosen criterion VIP>10). For the evaluation of the final conclusions about relation between independent variables and dependant variable, (ordinary) odds relation (OR_o) and its 95 % confidence intervals (CI) were calculated.

Chosen level of statistical significance was $\alpha = 0.05$, results were rated as statistically significant when $p \leq 0,05$.

Statistics packages SPSS (v. 13.00), "Excel 2003" and "WinPEPI" (v. 1.55) were used for the administration and analysis of the data.

3. RESULTS

3.1. Characteristic of the investigated quota

Distribution of 1022 subjects with type 2 diabetes accordingly to: gender, age, education, education, marital status, social position, DM duration, BMI, complications, smoking, changes of habits of the nutrition and physical activity after diagnosis of DM, depression and anxiety states is presented in the Table 1.

Table 1. General characteristics of patients with type 2 diabetes (n=1022)

Variables		Absolute number (%)
Gender	men	372 (36.4)
	women	650 (63.6)
Age (years): \bar{x} – 59.31; Md – 59.00		
Age	35–44 y.o.	16 (1.6)
	45–54 y.o.	287 (28.1)
	55–64 y.o.	390 (38.1)
	65–74 y.o.	329 (32.2)
Education	elementary	117 (11.4)
	incomplete secondary	139 (13.6)
	secondary	274 (26.8)

	vocational	302 (29.5)
	higher	190 (18.6)
Marital status	single	27 (2.6)
	married	659 (64.5)
	divorced	148 (14.5)
	widow (-er)	188 (18.4)
Social status	blue-collar workers	254 (24.9)
	white-collar workers	223 (21.8)
	pensioners	438 (42.9)
	disabled	107 (10.5)
Duration of DM in years	up to 5 years	366 (35.8)
	6–10 years	346 (33.9)
	11–15 years	184 (18.0)
	16 years and >	126 (12.3)
Duration of DM in years: \bar{x} – 8.84; Md – 7.00		
BMI (kg/m²)	Up to 18.4 kg/m ²	0 (0)
	18.5–24.9 kg/m ²	20 (2.0)
	25–29.9 kg/m ²	437 (42.8)
	30 and > kg/m ²	565 (55.2)
BMI (kg/m²): \bar{x} – 30.80; Md – 30.00		
Had DM complications		738 (72.2)
of them:	nephropathy	343 (33.6)
	retinopathy	588 (57.5)
	angiopathy	558 (54.6)
	polyneuropathy of legs	329 (32.2)
Patients with arterial hypertension		760 (74.4)
Treatment method	diet	99 (9.7)
	peroral medicines	452 (44.2)
	insulin	432 (42.3)
	combinative therapy	39 (3.8)
Smoking		451 (44.1)
Changed nutrition habits after DM diagnosis		894 (87.5)
Began take more exercises after DM diagnosis		346 (33.9)
Depressive state		291 (28.5)
Anxiety		433 (42.4)

Abbreviations on page 5.

Frequency of **complications of the diabetes** was dependant on the duration of the disease (df=1; $\chi^2=19.78$; $p<0.001$). 74.4 percent of all subjects who participated in the survey marked that they had arterial hypertension (AH). Frequency of AH depended on the duration of the disease (df=1; $\chi^2=10.01$; $p=0.002$).

3.2. Relation between the fields of quality of the life and the factors of the patient: gender, age, BMI, education, social group, marital status and smoking

Gender. Accordingly to data of the survey, women in compare with men were evaluating all fields of quality of the life in lower points ($p<0.001$).

When assessing relation between fields of quality of the life and gender, following factors were controlled ones: age, BMI, education, social group, marital status, and smoking.

Calculations of the multi-dimensional logistical regression (while considering influence of the controlling factors) confirmed, that masculine gender had positive impact ($OR_o = 0.07-0.42$; $p \leq 0.001$) on the evaluation of all QL field (except physical functioning ($OR_o = 0.85$; 95% CI 0.55–1.31; $p=0.461$)).

Age. While comparing the averages of QL evaluation points (Spearman correlation) in the different groups of age, it was revealed that rating of the all fields of quality of the life was decreasing as the age increased ($p < 0.001$).

Calculations of the multi-dimensional logistical regression (while considering influence of the controlling factors) showed that age of the subjects had few influence, and only following QL fields were rated worse: vitality ($OR_o = 1.05$; 95% CI 1.01–1.09; $p=0.015$) and physical health ($OR_o = 1.05$; 95% CI 1.01–1.09; $p=0.028$) (Table 2).

Table 2. Relation between the fields of quality of the life and age of the patients

QL fields	Age					
	OR _g	95% CI	p	OR _o	95% CI	p
PF	1.08	1.06–1.11	<0.001	1.02	0.98–1.06	0.257
RP	1.08	1.06–1.10	<0.001	0.98	0.95–1.02	0.292
RE	1.06	1.04–1.08	<0.001	0.98	0.95–1.01	0.216
SF	1.05	1.03–1.07	<0.001	0.98	0.94–1.01	0.174
ES	1.07	1.05–1.10	<0.001	1.02	0.98–1.07	0.354
VT	1.07	1.05–1.10	<0.001	1.05	1.01–1.09	0.015
BP	1.08	1.05–1.10	<0.001	1.03	0.99–1.07	0.149
GH	1.07	1.05–1.09	<0.001	1.04	1.00–1.08	0.066
PH	1.10	1.08–1.13	<0.001	1.05	1.01–1.09	0.028
MH	1.06	1.04–1.08	<0.001	0.99	0.96–1.03	0.598

Abbreviations on page 5.

BMI. Negative correlation was determined between BMI and following fields of QL: physical functioning ($r_s = -0.075$; $p=0.016$), role limitations due to physical health problems ($r_s = -0.106$; $p=0.001$) and physical health ($r_s = -0.066$; $p=0.034$).

Performed multi-dimensional logistical regression showed that BMI had weak positive effect to evaluate in higher points the following fields: social functioning ($OR_o = 0.96$; 95% PI 0.92–1.00; $p=0.044$), emotional state ($OR_o = 0.91$; 95% CI 0.86–0.96; $p < 0.001$), physical health ($OR_o = 0.94$; 95% CI 0.90–0.98; $p=0.008$) and mental health ($OR_o = 0.95$; 95% CI 0.91–1.00; $p=0.028$).

Education. The fields of quality of the life were rated by the lowest points by subjects with elementary education: following fields were evaluated in the lowers points: role limitations due to physical health problems ($\bar{x} = 17.74$; Md = 0.00); general health ($\bar{x} = 19.10$; Md = 20.00). Highest points for all fields of quality of the life were received from respondents with vocational and higher education ($p < 0.001$). Direct correlation between education and evaluation of all QL fields was determined ($p \leq 0.001$).

Relation between the fields of quality of the life of the subjects and education, meanwhile controlled factors were following: gender, age, BMI, social group, marital status, and smoking. The comparative group was elementary education.

Corrected odds ratio (when considering controlling factors) showed that **incomplete secondary** education was positively influence when evaluating following QL fields: physical functioning ($OR_o = 0.10$; 95% CI 0.05–0.18; $p < 0.001$); role limitations due to physical health problems ($OR_o = 0.52$; 95% CI 0.30–0.93; $p=0.026$); emotional state ($OR_o = 0.18$; 95% CI 0.09–0.36; $p < 0.001$); vitality ($OR_o = 0.21$; 95% CI 0.11–0.39; $p < 0.001$); bodily pain ($OR_o = 0.37$; 95% CI 0.20–0.68; $p=0.002$) and mental health ($OR_o = 0.07$; 95% CI 0.03–0.15; $p < 0.001$).

For those who had **secondary** education, direct link with higher rating of the following QL fields was determined: physical functioning (OR_o = 0.19; 95% CI 0.10–0.35; p<0.001); social functioning (OR_o = 0.25; 95% CI 0.13–0.51; p<0.001); emotional state (OR_o = 0.22; 95% PI 0.11–0.45; p<0.001); vitality (OR_o = 0.20; 95% PI 0.10–0.39; p<0.001); physical health (OR_o = 0.49; 95% PI = 0.26–0.91; p=0.024) and mental health (OR_o = 0.23; 95% PI = 0.12–0.43; p<0.001).

Vocational education had positive effect while evaluating seven QL fields of ten: physical functioning (OR_o = 0.09; 95% CI 0.04–0.16; p<0.001); role limitations due to physical health problems (OR_o = 0.44; 95% CI 0.23–0.83; p=0.011); role limitations due to emotional problems (OR_o = 0.37; 95% CI 0.20–0.71; p=0.003); social functioning (OR_o = 0.38; 95% CI 0.20–0.74; p=0.004); vitality (OR_o = 0.18; 95% CI 0.09–0.35; p<0.001); physical health (OR_o = 0.25; 95% CI 0.13–0.49; p<0.001) and mental health (OR_o = 0.20; 95% PI 0.10–0.38; p<0.001).

For those who had **higher** education, direct link with higher rating of the all QL fields was determined (OR_o = 0.08–0.51; p<0.05).

Social position. Disabled subjects and pensioners rated all fields of quality of the life in lower points when comparing with groups of the blue-collar workers and the white-collar workers (p<0.001). While comparing groups of the blue-collar workers, white-collar workers and pensioners it was determined, that pensioners rated all fields of QL in lower points (p<0.001): the least number of points was received for evaluation of the general health perceptions (\bar{x} = 32.41; Md = 30.00) and role limitations due to physical health problems (\bar{x} = 38.30; Md = 25.00).

Relation between fields of quality of the life and social position of the subjects was assessed by one-dimensional and multi-dimensional logistical regression when the controlled factors were following: gender, age, BMI, education, marital status, and smoking. The blue-collar workers made the comparative group.

Accordingly to the data of the multi-dimensional logistical regression, **the white-collar workers** had strong negative effect on the worse evaluation of the following QL fields: role limitations due to physical health problems (OR_o = 13.85; 95% CI 5.00–38.36; p<0.001); role limitations due to emotional problems (OR_o = 11.62; 95% CPI 4.99–27.03; p<0.001); social functioning (OR_o = 5.56; 95% CI 2.34–13.21; p<0.001); vitality (OR_o = 2.68; 95% CI 1.27–5.64; p=0.001); bodily pain (OR_o = 6.29; 95% CI 2.64–14.98; p<0.001); general health perceptions (OR_o = 5.06; 95% CI 2.26–11.32; p<0.001); physical health (OR_o = 9.81; 95% CI 3.97–24.22; p<0.001) and mental health (OR_o = 2.62; 95% CI 1.23–5.58; p=0.013).

Pensioners had strong and very strong negative effect to rate all fields of quality of the life in lower points (OR_o = 2.09–39.75; p<0.05). The strongest link was determined in the case of the worse evaluation of the QL field of role limitations due to emotional problems (OR_o = 39.75; 95% CI 14.40–109.68; p<0.001).

Disabled people had very strong negative effect on the evaluation of all fields of quality of the life: the weakest relation was for rating emotional state (OR_o = 2.61; 95% CI 1.16–5.87; p=0.020); the strongest links were determined for the evaluation of the following QL fields: role limitations due to physical health problems (OR_o = 71.70; 95% CI 26.11–196.90; p<0.001); social functioning (OR_o = 41.23; 95% CI 17.25–98.58; p<0.001); bodily pain (OR_o = 28.25; 95% CI 11.70–68.22; p<0.001); physical functioning (OR_o = 20.56; 95% CI 10.31–39.80; p<0.001); physical health (OR_o = 19.05; 95% CI 7.90–45.95; p<0.001); role limitations due to emotional problems (OR_o = 17.15; 95% CI 7.72–38.1; p<0.001); general health perceptions (OR_o = 13.39; 95% CI 6.19–28.96; p<0.001) and vitality (OR_o = 8.00; 95% CI 4.00–16.08; p<0.001).

Marital status. Widows(-ers) rated in lower points the all fields of quality of the life (p<0.001). Lowest points were received by following field of quality of the life: general health perceptions (\bar{x} = 32.72; Md = 30.00), role limitations due to physical health problems (\bar{x} = 35.24; Md = 25.00).

Considering the controlling factors, the following was determined: **married** had positive effect to rate in higher points the following fields of quality of the life: vitality ($OR_o = 0.28$; 95% CI 0.10–0.78; $p=0.015$); bodily pain ($OR_o = 0.14$; 95% CI 0.05–0.43; $p<0.001$) and general health perceptions ($OR_o = 0.12$; 95% CI 0.04–0.36; $p<0.001$); **divorced** subjects had direct effect to evaluate in higher points: physical functioning ($OR_o = 0.21$; 95% CI 0.06–0.77; $p=0.019$); bodily pain ($OR_o = 0.30$; 95% CI 0.10–0.93; $p=0.037$) and general health perceptions ($OR_o = 0.21$; 95% CI 0.07–0.64; $p=0.006$) fields of quality of the life, although a strong influence to make lower rating on the following field of quality of the life: role limitations due to emotional problems ($OR_o = 3.45$; 95% CI 1.09–10.93; $p=0.036$); direct link of **group of the widows-(ers)** was determined for: vitality ($OR_o = 0.13$; 95% CI 0.04–0.39; $p<0.001$); bodily pain ($OR_o = 0.22$; 95% CI 0.07–0.67; $p=0.008$) and general health perceptions ($OR_o = 0.12$; 95% CI 0.04–0.37; $p<0.001$) fields of quality of the life.

Smoking. Subjects who participated in the survey and had a harmful habit of smoking, were rating all fields of quality of the life in higher points in compare with non-smoking respondents ($p<0.001$).

Relation between fields of quality of the life and smoking of the subjects was assessed by one-dimensional and multi-dimensional logistical regression when the controlled factors were following: gender, age, BMI, social group, education, marital status. The non-smoking subjects made the comparative group.

Performed multi-dimensional logistical regression showed that smoking subjects had a weak influence to better evaluations of: role limitations due to emotional problems ($OR_o = 0.52$; 95% CI 0.35–0.78; $p=0.001$) and general health perceptions fields of QL, but rate in lower points ($OR_o = 1.78$; 95% CI 1.17–2.71; $p=0.008$) the field of vitality. Such results could be relevant to better health of the subjects.

3.3. Relation between quality of the life and the factors of the disease of patients with type 2 diabetes: duration of the DM, complications, treatment methods, hypertension, changes of nutritional habits and physical activity after the diagnosis of DM

Duration of the DM. Duration of the disease had impact on the evaluation of all fields of quality of the life. Patients who had diabetes for longer period, statistically significantly rated in lower points all fields of quality of the life ($p<0.001$) (Table 3).

Table 3. Evaluation of quality of the life in all group of the subject (n=1022), considering duration of the disease

SF-36 the fields of quality of the life	Duration of the disease (in years)				r_s
	Up to 5 years n=366 (35.8 %)	6–10 years n=346 (33.9%)	11–15 years n=184 (18.0 %)	16 years and > n=126 (12.3 %)	
	Md (\bar{x})	Md (\bar{x})	Md (\bar{x})	Md (\bar{x})	
PF	80.00 (75.31)	70.00 (69.41)	60.00 (60.60)	45.00 (44.92)*	-0.378
RP	75.00 (68.24)	62.50 (57.37)	25.00 (34.65)	0.00 (18.45)*	-0.409
RE	100.00 (77.14)	100.00 (65.03)	33.33 (52.36)	33.33 (45.50)*	-0.286
SF	77.78 (72.50)	66.67 (65.55)	55.56 (52.49)	44.44 (44.18)*	-0.362

ES	72.00 (67.81)	72.00 (63.92)	52.00 (52.85)	56.00 (53.75)*	-0.319
VT	70.00 (65.87)	60.00 (58.22)	50.00 (46.82)	35.00 (37.42)*	-0.428
BP	77.78 (72.01)	77.78 (69.23)	44.44 (52.54)	33.33 (45.85)*	-0.301
GH	50.00 (48.41)	45.00 (44.21)	30.00 (26.42)	20.00 (20.79)*	-0.441
PH	54.00 (50.95)	48.50 (48.25)	42.00 (41.12)	34.00 (36.34)*	-0.419
MH	53.50 (49.96)	49.00 (46.47)	41.00 (39.86)	36.50 (37.26)*	-0.400

*p<0.001. Abbreviations on page 5.

Relation between quality of the life and the factors of the disease of patients, was evaluated by one-dimensional and multi-dimensional logistical regression method, when controlled factors were following: complications, treatment method, hypertension, changes of the nutritional habits and physical activity after diagnosis of DM. The comparative group consisted of the subjects whose duration of the disease was up to 5 years.

Multi-dimensional logistical regression showed that not strong influence was typical to **6–10 years** duration of DM, only role limitations due to physical health problems ($OR_o = 1.87$; 95% CI 1.18–2.97; $p=0.008$) as field of QL was rated in lower points; **11–15 years** duration of DM had negative impact on all fields of quality of the life ($OR_o = 1.74$ – 4.20 ; $p<0.05$), except to field of the role limitations due to emotional problems ($OR_o = 0.98$; 95% CI 0.60–1.62; $p=0.950$); **16 years and >** duration of DM had negative impact on all fields of quality of the life ($OR_o = 1.74$ – 6.61 ; $p<0.005$), except following fields of quality of the life: the role limitations due to emotional problems ($OR_o = 0.99$; 95% CI 0.58–1.68; $p=0.962$), emotional state ($OR_o = 1.68$; 95% CI 0.92–3.06; $p=0.091$) and mental health ($OR_o = 1.14$; 95% PI 0.64–2.04; $p=0.662$) (Table 4).

Table 4. Relation between duration of the disease and fields of quality of the life

QL fields	Duration of DM*					
	OR _g	95% CI	p	OR _o	95% CI	p
6–10 years						
PF	1.45	0.95–2.23	0.088	1.18	0.75–2.23	0.470
RP	2.70	1.75–4.18	<0.001	1.87	1.18–2.97	0.008
RE	1.25	0.85–1.84	0.285	0.70	0.46–1.08	0.104
SF	1.36	0.86–2.16	0.187	1.13	0.70–1.82	0.631
ES	1.00	0.62–1.62	0.987	0.69	0.42–1.15	0.155
VT	2.10	1.33–3.33	0.002	1.41	0.87–2.29	0.170
BP	1.23	0.77–1.95	0.394	0.86	0.52–1.42	0.551
GH	1.39	0.86–2.56	0.176	1.22	0.74–2.01	0.433
PH	1.36	0.86–2.16	0.187	1.13	0.70–1.82	0.631
MH	2.44	1.61–3.70	<0.001	1.53	0.98–2.20	0.063
11–15 years						
PF	2.88	1.83–4.53	<0.001	2.01	1.27–3.41	0.004
RP	6.57	4.15–10.40	<0.001	4.20	2.56–6.90	<0.001
RE	2.16	1.42–3.30	<0.001	0.98	0.60–1.62	0.950

SF	3.60	2.56–5.73	<0.001	2.35	1.42–3.89	0.001
ES	2.96	1.85–4.72	<0.001	2.63	1.59–4.43	<0.001
VT	4.34	2.68–7.02	<0.001	2.87	1.67–4.86	<0.001
BP	3.13	1.96–5.01	<0.001	1.74	1.02–2.97	0.043
GH	4.53	2.82–7.28	<0.001	3.39	2.03–5.63	<0.001
PH	3.60	2.26–5.73	<0.001	2.35	1.42–3.89	0.001
MH	4.58	2.92–7.18	<0.001	2.59	1.56–4.30	<0.001
16 years and >						
PF	6.62	4.12–10.62	<0.001	4.22	2.43–7.35	<0.001
RP	15.35	9.28–25.37	<0.001	6.61	3.76–11.58	<0.001
RE	3.31	2.10–5.21	<0.001	0.99	0.58–1.68	0.962
SF	9.48	5.82–15.43	<0.001	5.01	2.91–8.63	<0.001
ES	2.98	1.77–4.99	<0.001	1.68	0.92–3.06	0.091
VT	8.09	4.88–13.40	<0.001	4.23	2.39–7.48	<0.001
BP	10.45	6.43–16.98	<0.001	4.19	2.38–7.40	<0.001
GH	7.57	4.58–12.51	<0.001	4.82	2.74–8.47	<0.001
PH	9.48	5.82–15.43	<0.001	5.01	2.91–8.63	<0.001
MH	3.23	1.93–5.38	<0.001	1.14	0.64–2.04	0.662

*comparative group – duration of the disease up to 5 years. Abbreviations on page 5.

Complications. The subjects who named different complications of diabetes, evaluated all fields of quality of the life in lower points ($p<0.001$).

Relation between fields of quality of the life and the complications, was evaluated by one-dimensional and multi-dimensional logistical regression method, when controlled factors were following: duration of the disease,, treatment method, hypertension, changes of the nutritional habits and physical activity after diagnosis of DM.

It was determined by one-dimensional and multi-dimensional logistical regression that complications directly influenced to rate all fields of QL in lower points ($OR_g = 2.71-9.43$; $p<0.001$).

Performed multi-dimensional logistical regression showed that complications had negative impact on following fields of QL: the role limitations due to emotional problems ($OR_o = 5.45$; 95% CI 2.86–10.37; $p<0.001$); social functioning ($OR_o = 1.79$; 95% CI 1.04–3.08; $p=0.036$); emotional state ($OR_o = 2.73$; 95% CI 1.54–4.82; $p=0.001$); vitality ($OR_o = 5.10$; 95% CI 2.65–9.82; $p<0.001$); physical health ($OR_o = 1.79$; 95% CI 1.04–3.08; $p=0.036$) and mental health ($OR_o = 3.41$; 95% PI 1.96–5.91; $p<0.001$) (Table 5).

Table 5. Relation between fields of quality of the life and DM complications

QL fields	CD complications					
	OR_g	95% CI	p	OR_o	95% CI	p
PF	2.71	1.79–4.10	<0.001	1.32	0.81–2.15	0.268
RP	4.19	2.75–6.38	<0.001	1.61	0.98–2.64	0.060
RE	9.44	5.18–17.19	<0.001	5.45	2.86–10.37	<0.001
SF	4.04	2.51–6.50	<0.001	1.79	1.04–3.08	0.036
ES	3.21	1.94–5.29	<0.001	2.73	1.54–4.82	0.001
VT	7.69	4.22–14.04	<0.001	5.10	2.65–9.82	<0.001
BP	3.37	2.14–5.29	<0.001	1.24	0.72–2.13	0.446
GH	2.75	1.77–4.26	<0.001	1.35	0.80–2.26	0.260
PH	4.04	2.51–8.50	<0.001	1.79	1.04–3.08	0.036
MH	5.11	3.12–8.37	<0.001	3.41	1.96–5.91	<0.001

Abbreviations on page 5.

The subjects with arterial hypertension evaluated all fields of quality of the life in lower points ($p < 0.001$).

Performed multi-dimensional logistical regression showed that **arterial hypertension** had negative effect on all fields ($OR_o - 1.78-2.99$; $p < 0.05$), except fields of vitality ($OR_o - 0.73$; 95% CI 0.46-1.14; $p = 0.166$) and mental health ($OR_o - 1.25$; 95% CI 0.81-1.95; $p = 0.318$).

Treatment method. Accordingly to the data of the survey, those subjects who were treated by diet ($p < 0.001$) and peroral medicines ($p < 0.001$) evaluated fields of the quality of life in higher points, in compare with the patients who were prescribed insulin and combinative treatment. This can be caused by the fact that insulin and combinative treatment is prescribed to the patients whose duration of the disease is longer.

Relation between fields of quality of the life and treatment method, was evaluated by one-dimensional and multi-dimensional logistical regression method, when controlled factors were following: duration of the disease, complications, hypertension, changes of the nutritional habits and physical activity after diagnosis of DM. Because of the small amount in the group, relation between quality of the life and treatment method of diet wasn't calculated. Relation between quality of the life and treatment by combinative therapy wasn't calculated, as combinative therapy consists of both peroral medicines and insulin.

Multi-dimensional logistical regression showed that **peroral treatment** had positive impact on the QL fields of the role limitations due to emotional problems ($OR_o - 0.16$. 95% CI 0.07-0.34; $p < 0.001$); bodily pain ($OR_o - 0.60$. 95% CI 0.39-0.92; $p = 0.020$) and mental health ($OR_o - 0.27$. 95% CI 0.13-0.57; $p = 0.001$), although strongly negatively influenced emotional state ($OR_o - 19.36$. 95% CI 2.12-126.43; $p < 0.001$). **Treatment with insulin** had positive effect on restriction of activity because of emotional problems ($OR_o - 0.23$. 95% CI 0.11-0.49; $p < 0.001$) and mental health ($OR_o - 0.38$. 95% CI 0.19-0.78; $p = 0.008$), but negative impact on bodily pain ($OR_o - 3.95$. 95% CI 1.41-11.09; $p = 0.009$), physical health ($OR_o - 4.14$. 95% CI 2.03-8.47; $p < 0.001$) and emotional state ($OR_o - 14.39$. 95% CI 1.90-109.05; $p = 0.010$) fields (Table 6).

Table 6. Relation between fields of quality of the life and treatment method

SF-36 fields of quality of the life	Treatment method					
	OR _g	95% CI	p	OR _o	95% CI	p
	peroral					
PF	0.60	0.44-0.82	0.002	1.02	0.45-2.30	0.971
RP	0.37	0.18-0.76	0.007	0.88	0.40-1.94	0.743
RE	0.11	0.05-0.22	<0.001	0.16	0.07-0.34	<0.001
SF	0.38	0.27-0.53	<0.001	0.49	0.23-1.07	0.073
ES	0.80	0.56-1.12	0.195	19.36	2.12-126.43	0.007
VT	0.37	0.26-0.52	<0.001	1.07	0.57-2.00	0.830
BP	0.40	0.28-0.56	<0.001	0.60	0.39-0.92	0.020
GH	0.48	0.34-0.67	<0.001	1.15	0.63-2.13	0.639
PH	0.40	0.29-0.57	<0.001	0.77	0.52-1.14	0.187
MH	0.49	0.35-0.67	<0.001	0.27	0.13-0.57	0.001
	insulin					
PF	2.11	1.55-2.87	<0.001	1.09	0.50-2.39	0.831
RP	1.29	0.64-2.57	0.478	1.48	0.69-3.17	0.310
RE	0.27	0.14-0.54	<0.001	0.23	0.11-0.49	<0.001
SF	3.71	2.67-5.15	<0.001	0.88	0.43-1.83	0.739

ES	1.87	1.33–2.64	<0.001	14.39	1.90–109.05	0.010
VT	2.69	1.96–3.70	<0.001	1.28	0.70–2.32	0.424
BP	2.57	1.89–3.49	<0.001	3.95	1.41–11.09	0.009
GH	2.44	1.76–3.38	<0.001	1.44	0.79–2.61	0.233
PH	3.71	2.67–5.15	<0.001	4.14	2.03–8.47	<0.001
MH	2.20	1.63–2.99	<0.001	0.38	0.19–0.78	0.008

Abbreviations on page 5.

Nutrition. 87.5 percent of the subjects noted that they changed their nutritional habits and began to take nutrition accordingly to recommendations provided by the therapist after diagnosis of diabetes. The respondents who marked that they changed their nutritional habits and began to take nutrition accordingly to recommendations provided by the therapist after diagnosis of diabetes, evaluated all fields of quality of the life in higher points in compare with respondents who ignored the recommendations (<0.001).

Relation between fields of quality of the life and changes of the nutritional habits after diagnosis of DM, was evaluated by one-dimensional and multi-dimensional logistical regression method, when controlled factors were following: duration of the disease, complications, hypertension, treatment method, changes of the physical activity after diagnosis of DM.

Performed one-dimensional logistical regression showed that change of nutrition had negative impact on all fields (except emotional state) of quality of the life ($OR_g - 0.33-0.64$; $p < 0.001$).

Calculations of the multi-dimensional logistical regression revealed (while considering the distorting factors) that change of the nutrition had positive effect only to emotional state ($OR_o - 1.72$; 95% CI - 1.01–2.93; $p = 0.047$).

Physical activity. Only third of the all subjects (33.9 percent) who participated in the survey marked that they had changed their habits of physical activity after diagnosis of DM – started doing sports, taking exercises at least 2–3 times per week. Respondents who marked that began doing sports, taking exercises at least 2–3 times per week after diagnosis of DM, evaluated in higher points fields of the physical functioning ($p = 0.008$), role limitations due to physical health problems ($p < 0.001$) and bodily pain ($p = 0.008$).

After analysis of the survey data it was founded that evaluation of quality of the life was dependant on the physical activity of the subjects: those respondents who marked that they are always doing sports or taking exercises at least 2–3 times per week, statistically significantly evaluated in higher points all fields of quality of the life (<0.01).

Relation between fields of quality of the life and changes of the **physical activity** habits after diagnosis of DM, was evaluated by one-dimensional and multi-dimensional logistical regression method, when controlled factors were following: duration of the disease, complications, hypertension, treatment method, changes of the nutritional habits after diagnosis of DM.

General odds ratio, without considering of the controlling factors, is showing that **physical activity** had positive influence to the following fields of quality of the life: ($OR_g - 0.72$; 95% CI 0.53–0.98; $p = 0.034$); emotional state ($OR_g - 0.58$; 95% PI 0.39–0.85; $p = 0.006$); vitality ($OR_g - 0.62$; 95% CI 0.44–0.87; $p = 0.007$); bodily pain ($OR_g - 0.43$; 95% CI 0.29–0.62; $p < 0.001$); general health perceptions ($OR_g - 0.67$; 95% CI 0.47–0.96; $p = 0.027$) and mental health ($OR_g - 0.44$; 95% CI 0.31–0.63; $p < 0.001$) (Table 7).

Positive impact on emotional state ($OR_o - 0.50$; 95% PI 0.32–0.76; $p = 0.001$); bodily pain ($OR_o - 0.49$; 95% CI 0.32–0.75; $p = 0.001$) and mental health ($OR_o - 0.44$; 95% CI 0.30–0.65; $p < 0.001$) was determined when considering the controlling factors (Table 7).

Table 7. Relation between fields of quality of the life and change of the physical activity of the subjects

QL fields	Changed habits of the physical activity					
	OR _g	95% CI	p	OR _o	95% CI	p
PF	1.06	0.77–1.46	0.713	1.40	0.97–2.02	0.072
RP	0.72	0.53–0.98	0.034	0.83	0.58–1.19	0.314
RE	0.99	0.72–1.35	0.933	1.09	0.76–1.56	0.654
SF	0.82	0.59–1.14	0.242	0.98	0.67–1.44	0.218
ES	0.58	0.39–0.85	0.006	0.50	0.32–0.76	0.001
VT	0.62	0.44–0.87	0.007	0.72	0.49–1.07	0.105
BP	0.43	0.29–0.62	<0.001	0.49	0.32–0.75	0.001
GH	0.67	0.47–0.96	0.027	0.79	0.53–1.17	0.234
PH	0.82	0.59–1.14	0.242	0.98	0.67–1.44	0.916
MH	0.44	0.31–0.63	<0.001	0.44	0.30–0.65	<0.001

Abbreviations on page 5.

3.4. Relation between depressive state, anxiety and the factors of the patient: gender, age, BMI, education, social group, marital status, harmful habits (smoking)

Gender. Depressive and anxiety states were noticed when sum of the HAD scale points was 8 points and over. In total depressive state prevailed for 28.5 percent of all the subjects (Table 1). Average of depression points was statistically significantly higher in the case of women (<0.001). Statistically significantly (<0.001) the depressive state more often was determined for women (32.3 percent), in compare with men (21.8 percent).

Anxiety state was determined for 42.4 percent of the all subjects (Table 1). Average of anxiety points was statistically significantly higher in the case of women (<0.001). Anxiety state, the same as depressive state, more often prevailed (p<0.001) for women (46.8 percent), in compare with men (34.7 percent (Table 8).

Table 8. Evaluation of the depressive state and anxiety in the groups of men and women

Criteria	All subjects n (%) 95% CI	Men n=372	Women n=650	df χ^2 p
		n (%) 95% CI	n (%) 95% CI	
Depressive state				
$\bar{x} \pm SD$	5.74±3.39	4.93±3.58	6.21±3.19	<0.001
8 points and >	291 (28.5) 25.72–31.35	81 (21.8) 17.68–26.32	210 (32.3) 28.72–36.05	df=1 $\chi^2=12.38$ <0.001
Anxiety				
$\bar{x} \pm SD$	7.16±4.32	6.11±4.44	7.76±4.14	<0.001
8 points and >	433 (42.4) 39.32–45.46	129 (34.7) 29.85–39.76	304 (46.8) 42.88–50.69	df=1 $\chi^2=13.68$ <0.001

Age. Both depressive state (p<0,001) and anxiety (p<0,001) more often prevailed over the older age subjects (Table 9).

Table 9. Evaluation of the depressive state and anxiety in the different age groups of the subjects

All subjects n (%)	Groups of age (in years)				df χ^2 p
	35–44 y.o. n=16 n (%) 95% CI	45–54 y.o. n=287 n (%) 95% CI	55–64 y.o. n=390 n (%) 95% CI	65–74 y.o. n=329 n (%) 95% CI	
Depressive state					
291 (28.5)	–	47 (16.4) 12.29–21.18	110 (28.2) 23.79–32.95	134 (40.7) 29.65–39.31	df=1 $\chi^2=24.70$ p<0.001
Anxiety					
433 (42.4)	–	68 (23.7) 18.89–29.04	166 (42.6) 37.60–47.64	199 (60.5) 54.98–65.81	df=1 $\chi^2=34.36$ p<0.001

BMI. When comparing prevalence of the depressive state and anxiety accordingly to the groups of BMI, it was revealed, that both depressive (p=0.538) and anxiety states (p=0.888) weren't dependant on BMI.

Calculations of the multi-dimensional regression (while considering influence of the distorting factors) confirmed that masculine gender had positive impact on depressive (OR_o – 0.56; 95% CI 0.39–0.79; p=0.001) and anxiety (OR_o – 0.57; 95% CI 0.42–0.79; p=0.001) states. **Age** had weak influence to depressive (OR_o – 1.09; 95% CI 1.06–1.13; p<0.001) and anxiety (OR_o – 1.16; 95% CI 1.12–1.19; p<0.001) states. **BMI** had no impact neither on depressive (OR_o – 1.00; 95% CI 0.97–1.04; p=0.885), nor on anxiety (OR_o – 1.01; 95% CI 0.97–1.04; p=0.772) states (Table 10).

Table 10. Relation between depressive state, anxiety and gender, age, BMI of the subjects

Variables	OR _g	95% CI	p	OR _o	95% CI	p
Depressive state						
Gender	0.58	0.43–0.78	<0.001	0.56	0.39–0.79	0.001
Age	1.07	1.05–1.09	<0.001	1.09	1.06–1.13	<0.001
BMI	1.04	1.01–1.07	0.016	1.00	0.97–1.04	0.855
Anxiety						
Gender	0.60	0.46–0.79	<0.001	0.57	0.42–0.79	0.001
Age	1.08	1.06–1.10	<0.001	1.16	1.12–1.19	<0.001
BMI	1.01	0.98–1.04	0.469	1.01	0.97–1.04	0.772

Education, social group and marital status. When comparing frequency of the depressive and anxiety states in the subjects' groups of the different education it was determined that frequency of depressive (p<0.001) anxiety states (p=0.028) was decreased as the education was increasing (Table 11).

Depressive state is more often noticed in the case of the disabled and pensioners (p=0.003), in compare with blue-collar workers and white-collar workers. Prevalence of the anxiety considering social groups was more often determined for white-collar workers and pensioners (p=0.010).

Depression was prevailing in the case of married subjects more rarely (25.0 percent) in compare with widows(-ers) (32.4 percent), divorced (33.8 percent) and single subjects (55.6 percent) (p=0.036).

Anxiety was also more often prevailing in the case of single (55.6 percent), divorced (54.7 percent), widows(-ers) (50.0 percent) than married (36.9 percent) respondents ($p=0.025$) (Table 11).

Table 11. Evaluation of the depressive state and anxiety while considering the social factors

Criteria	Number of the subjects n	Of them with depressive state		Of them with anxiety	
		absolute number (%)	95% CI	absolute number (%)	95% CI
Education:					
elementary	117	68 (58.1)	48.64–67.11	64 (54.7)	45.23–63.92
incomplete secondary	139	45 (32.3)	24.69–40.83	70 (50.4)	41.76–58.94
secondary	274	78 (28.5)	23.20–34.21	113 (41.2)	35.35–47.32
vocational	302	62 (20.5)	16.13–25.53	112 (37.1)	31.62–42.81
higher	190	38 (20.0)	14.56–26.40	74 (38.9)	31.97–46.27
		df=1 $\chi^2=28.08$ p<0.001		df=1 $\chi^2=4.86$ p=0.028	
Social position:					
blue-collar workers	254	49 (19.3)	14.63–24.69	75 (29.5)	23.99–35.55
white-collar workers	223	53 (23.8)	13.34–29.91	97 (43.5)	36.89–50.28
pensioners	438	146 (33.3)	28.93–37.96	217 (49.5)	44.76–54.33
disabled	107	43 (40.2)	30.82–50.11	44 (41.1)	31.70–51.05
		df=3 $\chi^2=14.11$ p=0.003		df=3 $\chi^2=11.26$ p=0.010	
Marital status:					
single	27	15 (55.6)	35.33–74.52	15 (55.6)	35.33–74.52
married	659	165 (25.0)	21.77–28.53	243 (36.9)	33.18–40.69
divorced	148	50 (33.8)	26.22–42.01	81 (54.7)	46.35–62.92
widow(-er)	188	61 (32.4)	25.81–39.64	94 (50.0)	42.64–57.36
		df=3 $\chi^2=8.54$ p=0.036		df=3 $\chi^2=9.31$ p=0.025	

Relation between the depressive, anxiety states and education was evaluated when the comparative group was elementary education. After calculations of the multi-dimensional logistical regression it was revealed that higher education of the subjects decreases frequency of the depressive states ($OR_g - 0.42-0.20$; $p \leq 0.002$). Influence of the education to anxiety state wasn't determined ($OR_g - 1.03-1.68$; $p > 0.05$) (Table 12).

Table 12. Relation between the depressive state, anxiety and education of the subjects

Education	OR_g	95% CI	p	OR_o	95% CI	p
Depressive state*						
Incomplete secondary	0.35	0.21–0.58	<0.001	0.42	0.24–0.74	0.002
Secondary	0.29	0.18–0.45	<0.001	0.39	0.22–0.69	0.001
Vocational	0.19	0.12–0.30	<0.001	0.24	0.13–0.43	<0.001
Higher	0.18	0.11–0.30	<0.001	0.20	0.11–0.36	<0.001
Anxiety*						
Incomplete secondary	0.84	0.51–1.38	0.489	1.68	0.98–2.91	0.061
Secondary	0.58	0.38–0.90	0.015	1.64	0.95–2.84	0.078
Vocational	0.49	0.32–0.75	0.001	1.37	0.78–2.40	0.278
Higher	0.53	0.33–0.84	0.007	1.03	0.59–1.77	0.929

*comparative group – elementary education.

Without consideration of the controlling factors it was determined that pensioners ($OR_g - 2.09$; 95% CI 1.45–3.03; $p < 0.001$) and disabled ($OR_g - 2.81$; 95% CI 1.71–4.62; $p < 0.001$) had negative impact on the depressive state. The white-collar workers ($OR_g - 1.84$; 95% CI 1.26–2.68; $p = 0.002$), pensioners ($OR_g - 2.34$; 95% CI 1.69–3.25; $p < 0.001$) and disabled ($OR_g - 1.67$; 95% PI 1.04–2.67; $p < 0.05$) negatively influenced the anxiety state (Table 13).

While considering the controlling factors it was revealed that white-collar workers had negative impact on depressive ($OR_o - 1.83$; 95% CI 1.07–3.12; $p = 0.027$) and anxiety ($OR_o - 2.82$; 95% CI 1.75–4.56; $p < 0.001$) states, meanwhile the disabled negatively influenced the depressive state ($OR_o - 2.51$; 95% CI 1.48–4.25; $p < 0.001$) (Table 13).

Table 13. Relation between the depressive state, anxiety and social position of the subjects

Social position	OR_g	95% CI	p	OR_o	95% CI	p
Depressive state*						
White-collar workers	1.30	0.84–2.02	0.235	1.83	1.07–3.12	0.027
Pensioners	2.09	1.45–3.03	<0.001	0.64	0.37–1.10	0.105
Disabled	2.81	1.71–4.62	<0.001	2.51	1.48–4.25	0.001
Anxiety*						
White-collar workers	1.84	1.26–2.68	0.002	2.82	1.75–4.56	<0.001
Pensioners	2.34	1.69–3.25	<0.001	0.68	0.41–1.12	0.126
Disabled	1.67	1.04–2.67	0.033	1.33	0.78–2.26	0.293

*comparative group – blue-collar workers.

Marital status of the subjects (married, divorced and widows(-ers)) had positive influence to the depressive state ($OR_o - 0.15-0.32$; $p < 0.05$); anxiety was positively influenced by married ($OR_o - 0.42$; 95% CI 0.18–1.00; $p = 0.051$) and widow(-ers) ($OR_o - 0.36$; 95% CI 0.15–0.89; $p = 0.027$) (Table 14).

Table 14. Relation between the depressive state, anxiety and marital status of the subjects

Marital status	OR _g	95% CI	p	OR _o	95% CI	p
Depressive state*						
Married	0.27	0.12–0.58	0.001	0.24	0.10–0.60	0.002
Divorced	0.41	0.18–0.94	0.035	0.32	0.12–0.82	0.019
Widow(-er)	0.38	0.17–0.87	0.022	0.15	0.06–0.38	<0.001
Anxiety*						
Married	0.47	0.11–1.02	0.054	0.42	0.18–1.00	0.051
Divorced	0.97	0.42–2.21	0.937	1.19	0.47–3.00	0.715
Widow(-er)	0.80	0.36–1.80	0.590	0.36	0.15–0.89	0.027

*comparative group – single.

Smoking. When comparing prevalence frequency of the depressive ($df=1$; $\chi^2=3.25$; $p=0.071$) state and anxiety ($df=1$; $\chi^2=0.34$; $p=0.559$) in the groups of smoking and non-smoking subjects, no statistically significant difference was found.

By one-dimensional and multi-dimensional logistical regression methods it was determined that smoking habit of the subject hadn't influenced depressive ($OR_o=1.12$; 95% CI – 0.79–1.58; $p=0.521$) and anxiety ($OR_o=1.34$; 95% CI – 0.97–1.84; $p=0.076$) states.

3.5. Relation between depressive state, anxiety and the factors of the disease of patients with type 2 diabetes: duration of the disease, complications, hypertension, treatment method, changes of nutritional habits and physical activity after DM diagnosis

Duration of DM. Both anxiety and depressive states were dependant on the duration of disease – if the duration of CD was increasing, the depressive ($df=1$; $\chi^2=39.13$; $p<0.001$) and anxiety ($df=1$; $\chi^2=19.42$; $p<0.001$) states were determined more often.

By one-dimensional and multi-dimensional logistical regression methods it was determined that the duration of disease, when comparative group the duration of disease up to 5 years, had negative impact on depressive ($OR_o=1.69$ –3.58; $p<0.00$) and anxiety ($OR_o=1.64$ –2.18; $p<0.05$) states (Table 15).

Table 15. Relation between depressive state, anxiety and duration of the disease

Duration of the disease	OR _g	95% CI	p	OR _o	95% CI	p
Depressive state*						
6-10 years	1.92	1.33–2.78	<0.001	1.69	1.15–2.49	0.008
11-15 years	3.40	2.67–6.00	<0.001	2.94	1.92–4.51	<0.001
16 years and >	5.14	3.29–8.05	<0.001	3.58	2.19–5.84	<0.001
Anxiety*						
6-10 years	2.74	2.00–3.75	<0.001	2.18	1.56–3.05	<0.001
11-15 years	2.66	1.83–3.85	<0.001	1.64	1.09–2.47	0.017
16 years and >	3.95	2.58–6.03	<0.001	2.15	1.34–3.43	0.001

*comparative group – duration of the disease is up to 5 years

Complications. Influence of the chronic complications of the diabetes to emotional state of patients is also confirmed by data of our performed survey. Anxiety ($df=1$; $\chi^2=57.24$;

p<0.001) and depressive state (df =1; $\chi^2=31.66$; p<0.001) more often prevailed in the case of complications of the diabetes.

For the respondents who had arterial hypertension, the depressive state was determined for 82.8 percent (df =1; $\chi^2=14.64$; p<0.001); anxiety - to 80.1 percent (df =1; $\chi^2=12.62$; p<0.001) of the subjects.

Accordingly to data of the multi-dimensional logistical, complications negatively influenced the depressive state (OR_o – 1.54; 95% CI 1.02–2.31; p=0,038) and anxiety (OR_o – 2.67; 95% CI 1.85–3.86; p<0.001). Morbidity with arterial hypertension had no effect on depressive (OR_o – 1.18; 95% CI 0.81–1.73; p=0.387) and anxiety (OR_o –1.05; 95% CI 0.75–1.47; p=0.792) states (Table 16).

Table 16. Relation between the depressive state, anxiety and DM complication, arterial hypertension

Variables	OR _g	95% CI	p	OR _o	95% CI	p
Depressive state						
With complications	2.74	1.92–3.92	<0.001	1.54	1.02–2.31	0.038
Anxiety						
With complications	4.25	3.07–5.89	<0.001	2.67	1.85–3.86	<0.001
Depressive state						
With arterial hypertension	1.97	1.40–2.78	<0.001	1.18	0.81–1.73	0.387
Anxiety						
With arterial hypertension	1.72	1.28–2.31	<0.001	1.05	0.75–1.47	0.792

Treatment method. For subjects who were treated with insulin, the depressive state was determined in 39.1 percent of cases (p<0.001), anxiety – in 47.9 percent of cases (p=0.008).

Accordingly to data of the multi-dimensional logistical regression, the depressive state was negatively influenced by peroral (OR_o – 3.71; 95% CI 1.36–10.10; p=0.010) treatment and treatment with insulin (OR_o – 4.08; 95% CI 1.53–10.87; p=0,005), meanwhile anxiety was negatively influenced by peroral treatment (OR_o – 1.87; 95% CI 1.35–2.58; p<0.001), and treatment by only prescribed diet was acting positively (OR_o – 0.43; 95% CI 0.23–0.78; p=0.006) (Table 17).

Table 17. Relation between depressive state, anxiety and treatment method

Treatment method	OR _g	95% CI	p	OR _o	95% CI	p
Depressive state						
diet	0.14	0.06–0.33	<0.001	0.77	0.21–2.81	0.694
peroral	0.71	0.53–0.93	0.014	3.71	1.36–10.10	0.010
insulin	2.47	1.87–3.25	<0.001	4.08	1.53–10.87	0.005
Anxiety						
diet	0.23	0.14–0.41	<0.001	0.43	0.23–0.78	0.006
peroral	1.08	0.84–1.38	0.567	1.87	1.35–2.58	<0.001
insulin	1.48	1.15–1.91	0.002	1.21	0.60–2.44	0.600

Nutrition, physical activity, smoking. Accordingly to data of the survey it was determined that frequency of the depressive state and anxiety was dependant on the nutritional

habits of the subjects. In the case of respondents who marked that they were always or most often following principles of the healthy nutrition, the depressive state ($p<0.001$) and anxiety ($p<0.001$) was determined more rarely in compare with those respondents who were following principles of the health nutritional only sometimes or never.

Depressive state ($p<0.001$) and anxiety ($p<0.001$) were more often prevailing for those subjects of the survey who hadn't changed their nutritional habits after diagnosis of DM.

Frequency of the depressive state ($p<0.001$) and anxiety ($p<0.001$) was dependant on the physical activity of the respondents: depressive state and anxiety were more often determined for the subjects who were doing sports, taking exercises at least 2-3 times per week only sometimes or never. Depressive state was prevailing in the case of respondents who hadn't changed their physical activity principles, although obtained results weren't statistically significant ($p=0.078$); anxiety was prevailing for those subjects who didn't start taking more sports or exercises after diagnosis of DM ($p=0.002$).

Frequency of depressive state and anxiety in the case of smoking and non-smoking subjects wasn't statistically significantly different.

By multi-dimensional logistical regression method it was determined that change of the nutrition (after diagnosis of DM) had positive impact on depressive ($OR_o = 0.40$; 95% CI 0.26–0.62; $p<0.001$) and anxiety ($OR_o = 0.24$; 95% CI 0.15–0.39; $p<0.001$) states. Change of the physical activity after diagnosis of DM and smoking hadn't influence depressive and anxiety states (Table 18).

Table 18. Relation between the depressive state, anxiety and nutritional and physical activity changes after diagnosis of DM

Variables	OR _g	95% CI	p	OR _o	95% CI	p
Depressive state						
Changed nutritional habits	0.27	0.19–0.40	<0.001	0.40	0.26–0.62	<0.001
Changed physical activity habits	0.76	0.57–1.02	0.067	0.99	0.72–1.38	0.968
Are smoking	0.77	0.58–1.01	0.061	1.12	0.79–1.58	0.521
Anxiety						
Changed nutritional habits	0.17	0.11–0.26	<0.001	0.24	0.15–0.39	<0.001
Changed physical activity habits	0.68	0.52–0.88	0.004	0.88	0.65–1.19	0.411
Are smoking	0.92	0.72–1.18	0.517	1.34	0.97–1.84	0.076

CONCLUSIONS

1. Masculine gender and higher education are relevant to better evaluation of all fields of quality of the life. Marital status had influence only for assessment of particular fields of quality of the life: in the group of married subjects - for evaluation of vitality, bodily pain and general health perceptions fields; in the group of divorced subjects – physical functioning, bodily pain and general health perceptions fields; in the group of widows(-ers) – social functioning, vitality, bodily pain and general health perceptions fields, although in the group of divorced subjects negative influence to rate the role limitations due to emotional problems in lower points was determined ($OR_o = 3.45$). In the case of pensioners ($OR_o = 2.09–39.75$) and disabled ($OR_o = 2.61–71.70$) strong and very strong correlation determined with all fields of quality of the life.

2. Age and body mass index aren't such important factors that would influence quality of the life because weak positive relation was determined only with four of ten fields of quality of the life (social functioning, emotional state, physical health and mental health) (OR – 0.91–0.96). Smoking is relevant to worse evaluation of the vitality (OR_o – 1.78), and also positive effect of the smoking that was determined to the evaluation of the role limitations due to emotional problems and to the general health perceptions, can be connected to better health of the subjects.
3. Duration of the disease was relevant to lower rating of all (OR_o – 4.19–6.61) fields of quality of the life, except to evaluation of the role limitations due to emotional problems, emotional state and mental health. Complications had negative impact on the QL fields of the role limitations due to emotional problems (OR_o – 5.45), vitality (OR_o – 5.10), mental health (OR_o – 3.41), emotional state (OR_o – 2.73), social functioning (OR_o – 1.79) and physical health (OR_o – 1.79), meanwhile hypertension negatively influenced all fields (OR_o – 1.78–2.99) except vitality and mental health.
4. Peroral treatment positively acted on the role limitations due to emotional problems, bodily pain and mental health, but had strong negative effect to evaluation of the emotional state (OR_o – 14.39). Treatment with insulin positively influenced evaluations of the following fields: the role limitations due to emotional problems and mental health, but at the same time negatively influenced evaluation of the emotional state, bodily pain and physical state (OR_o – 3.95–14.39). Change of the nutrition isn't such important factor that would influence quality of the life, as negative impact was made only on emotional state; and physical activity is an important factor to evaluate emotional state, bodily pain and mental health (OR_o – 0.44–0.50) fields in higher points.
5. Muscular gender, higher education, inclusion in the group of married, divorced and widows(ers) group had positive impact, and meanwhile age, inclusion in the group of white-collar workers and disabled – negative impact on the depressive state. Muscular gender and inclusion in the group of widows (-ers) had positive influence, and meanwhile age inclusion in the group of white-collar workers – negative effect on anxiety state. Body mass index and smoking hadn't significant effect on depression and anxiety states.
6. Depressive state was negatively influenced by following factors: duration of the disease (OR_o – 1.69–3.58), complications (OR_o – 1.54), hypertension (OR_o – 1.8), peroral treatment (OR_o – 3.71) and treatment with insulin (OR_o – 4.08). Positive impact on the depressive state was imposed by change of the nutrition after diagnosis of diabetes. Anxiety state was negatively influenced by peroral treatment, meanwhile treatment by diet, change of the nutritional habits after diagnosis of diabetes (OR_o – 0.24) had positive influence to anxiety state. Morbidity with arterial hypertension, change of the physical activity after DM diagnosis and smoking didn't have influence to depression and anxiety states.

Practical recommendations

To perform an initial prevention of the type 2 diabetes, it is purposeful to teach society, particular attention must be paid to the promotion of healthy lifestyle, explain the factors which increases risk to get diabetes, in order to decrease morbidity of this disease. Particularly focused attention must be given for those who are in the risk group.

To teach patients with diabetes principles of the healthy lifestyle – to reject harmful habits, to explain about usefulness of healthy nutrition, physical activity to the health, in order to avoid or decrease chronic complications of the patients with diabetes, as complications are one of the main factors impairing quality of the life and emotional state of the patients with type 2 diabetes.

Moreover, we recommend to pay attention to emotional state of the patients with type 2 diabetes. Hospital anxiety and depression (HAD) evaluation scale is a convenient and fast way to evaluate anxiety and depression, therefore therapists and health care experts would be able to use it not only for emotional state evaluation of the patients with diabetes, but also of the patients with other chronic diseases.

While preparing programs of the diabetes it is important to consider influence of the age, social factors, duration of the disease, complications, nutrition and physical activity, to quality of the life and emotional state.

LIST OF THE PUBLISHED WORKS ON THE THEME OF DISSERTATION

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Poster presentations:

1. Mikaliūkštienė A, Stefanovič B. "Psychoemotional status of patients with type 2 diabetes". International conference "Baltic contribution to nursing research", 2009, 22nd of January 2009; *Baltic Nurse*, 2008 (2), p. 71.
2. Mikaliūkštienė A. "Patients' of type 2 diabetes quality of the life in Lithuania". 8th International Scientific Conference "Theory. Research and education in nursing and midwifery", 20-21st of May 2009, Martin, Slovakia.

SERGANČIŲJŲ 2-OJO TIPO CUKRINIŲ DIABETU GYVENIMO KOKYBĖS IR EMOCINĖS BŪSENOS RYŠYS SU LIGOS IR SOCIALINIAIS VEIKSNIAIS

Disertacijos reziumė

Darbo aktualumas.

Lietuvoje kaip ir visame pasaulyje sergančiųjų cukriniu diabetu (CD) skaičius kasmet didėja. Lietuvos sveikatos informacijos centro duomenimis 18 metų ir vyresnių amžiaus grupėje 2004 m. registruota 19,7 atvejai 1000-čiui gyventojų, o 2008 m. – 25,1 atvejai 1000-čiui gyventojų, tai sudaro 67 506.

Cukrinis diabetas – tai lėtinė nepagydoma liga, kuri turi įtakos sergančiųjų gyvenimo kokybei. Sergantieji cukriniu diabetu susiduria su daugeliu problemų: tai nuolatinis vaistų vartojimas, insulino injekcijos, gliukozės kiekio svyravimai, sveikatos būklės pokyčiai, mitybos ir fizinio aktyvumo režimas. Gresiančios ūminės ir lėtinės diabeto komplikacijos neabejotinai daro įtaką sergančiojo asmens psichologinei savijautai bei gyvenimo kokybei. Be šių su liga susijusių veiksnių, gyvenimo kokybei įtakos turi: išsilavinimas, gyvenimo sąlygos, būstas, užimtumas, materialinė gerovė, fizinė, dvasinė sveikata ir socialinė aplinka, nepriklausomumo lygis, moralinės nuostatos, asmeninis ir šeiminis gyvenimas ir kt. Vienas iš svarbiausių veiksnių, turinčių įtakos gyvenimo kokybei, yra sveikata.

Cukrinis diabetas, ypač jo komplikacijos, sukelia ne tik fizinės sveikatos pablogėjimą, kartu skatina psichoemocinių ir socialinių problemų atsiradimą. Susirgęs žmogus turi keisti įprastą gyvenimo būdą, taikytis prie naujų gyvenimo aplinkybių, išgyvena labai daug neigiamų emocijų, kurios lemia mažesnę socialinę adaptaciją, darbingumo sumažėjimą ir negalią.

Pasaulyje atlikta nemažai tyrimų apie sergančiųjų 2-ojo tipo cukriniu diabetu gyvenimo kokybę ir emocinę būseną. Jais remiantis įrodyta, kad cukrinis diabetas daro neigiamą įtaką sergančiųjų gyvenimo kokybei ir emocinei būsenai. Tokius duomenis skelbia JAV, Olandijoje, Estijoje ir kitose šalyse atlikti sergančiųjų 2-ojo tipo cukriniu diabetu gyvenimo kokybės tyrimai.

Lietuvoje sergančiųjų 2-ojo tipo cukriniu diabetu gyvenimo kokybės ir emocinės būsenos ryšys su ligos (CD trukmė, komplikacijos, gydymo būdas, hipertenzija, mitybos įpročiai ir fizinio aktyvumo pokyčiai nustačius CD) ir ligonio (lytis, amžius, KMI, išsilavinimas, socialinė grupė, šeiminių padėtis, žalingi įpročiai (rūkymas) veiksniais nebuvo tirtas. Tai ir paskatino mus imtis šio tyrimo ir išsamiai išnagrinėti sergančiųjų 2-ojo tipo cukriniu diabetu ligos (CD trukmė, komplikacijos, gydymo būdas, hipertenzija, mitybos įpročiai ir fizinio aktyvumo pokyčiai nustačius CD) ir ligonio (lytis, amžius, KMI, išsilavinimas, socialinė grupė, šeiminių padėtis, žalingi įpročiai (rūkymas) veiksmų įtaką gyvenimo kokybei ir emocinei būsenai.

Darbo tikslas – nustatyti sergančiųjų 2-ojo tipo cukriniu diabetu ligos ir socialinių veiksmų ryšį su gyvenimo kokybe ir emocine būseną.

Siekiant darbo tikslo buvo iškelti sekantys uždaviniai:

1. Įvertinti gyvenimo kokybės ryšį su ligonio veiksniais: lytimi, amžiumi, kūno masės indeksu, išsilavinimu, socialine grupe, šeimine padėtimi, ir kai kuriais žalingais įpročiais.
2. Nustatyti gyvenimo kokybės ryšį su ligos veiksniais: cukrinio diabeto trukmė, komplikacijomis, gydymo būdu, hipertenzija, mitybos įpročiai ir fizinio aktyvumo pokyčiais, nustačius cukrinį diabetą.
3. Išanalizuoti depresijos ir nerimo ryšį su ligonio veiksniais: lytimi, amžiumi, kūno masės indeksu, išsilavinimu, socialine grupe, šeimine padėtimi ir kai kuriais žalingais įpročiais.

4. Įvertinti depresijos ir nerimo ryšį su ligos veiksniais: cukrinio diabeto trukmė, komplikacijomis, gydymo būdu, hipertenzija, mitybos įpročių ir fizinio aktyvumo pokyčiais, nustačius cukrinį diabetą.

Darbo mokslinis naujumas. Šiame darbe ištirta sergančiųjų 2-ojo tipo cukriniu diabetu gyvenimo kokybė ir emocinė būseną, atsižvelgiant į ligonio (lytis, amžius, kūno masės indeksas, išsilavinimas, socialinė grupė, šeiminė padėtis, žalingi įpročiai (rūkymas) ir ligos (cukrinio diabeto trukmė, komplikacijos, gydymo būdas, hipertenzija, mitybos įpročių ir fizinio aktyvumo pokyčiai nustačius cukrinį diabetą) veiksnius. Įvertintas gyvenimo kokybės ryšys su ligonio ir su ligos veiksniais. Išanalizuoti depresijos ir nerimo ryšiai su ligonio (lytis, amžius, kūno masės indeksas, išsilavinimas, socialinė grupė, šeiminė padėtis, žalingi įpročiai (rūkymas) ir su ligos veiksniais (cukrinio diabeto trukmė, komplikacijos, gydymo būdas, hipertenzija, mitybos įpročių ir fizinio aktyvumo pokyčiai nustačius cukrinį diabetą).

Atliktas išsamus sergančiųjų 2-ojo tipo cukriniu diabetu gyvenimo kokybės ir emocinės būsenos tyrimas leido plačiau apžvelgti įvairių veiksmų įtaką gyvenimo kokybei ir emocinei būsenai.

Šis darbas galėtų būti naudingas visuomenės sveikatos specialistams ir sveikatos politikams, rengiant ir įdiegiant į praktiką CD profilaktines sveikatos programas.

Disertacijos struktūra ir apimtys. Darbą sudaro šie pagrindiniai skyriai: įvadas, literatūros apžvalga, tyrimo medžiaga ir metodai, rezultatai, rezultatų aptarimas, išvados ir praktinės rekomendacijos; 53 lentelės ir 3 paveikslai. Įvade bendrais bruožais pateikiama tiriamoji problema, tyrimo tikslas ir įvardijami iškelti uždaviniai, darbo mokslinis naujumas. Literatūros apžvalgoje aprašomi sergančiųjų 2-ojo tipo cukriniu diabetu gyvenimo kokybės tyrimai, ligos paplitimas pasaulyje ir Lietuvoje, sergančiųjų 2-ojo tipo CD gyvenimo kokybės ir emocinės būsenos tyrimai, atsižvelgiant į įvairius ligonio ir ligos veiksnius. Skyriuje „Tyrimo medžiaga ir metodai“ aprašomas tyrimo metodas, tyrimo eiga, duomenų analizė. Rezultatų skyriuje pateikiami gauti tyrimo rezultatai, nurodomas jų statistinis patikimumas. Rezultatų aptarimo skyriuje – gauti tyrimo rezultatai lyginami su kitų tyrėjų duomenimis. Darbo pabaigoje, atsižvelgiant į darbe iškeltus uždavinius, apibendrinami tyrimo rezultatai ir pateikiamos išvados ir praktinės rekomendacijos. Disertacijos pabaigoje pateikiamas literatūros sąrašas, kuriame yra 284 bibliografiniai šaltiniai.

Atlikus tyrimą ir išanalizavus gautus rezultatus, padarytos šios išvados:

1. Vyriška lytis, aukštasis išsilavinimas yra susiję su geresniu visų gyvenimo kokybės sričių vertinimu. Šeiminė padėtis tokią poveikį turėjo tik vertinant tam tikras gyvenimo kokybės sritis: vedusių (ištekęsusių) grupėje: energingumo / gyvybingumo, skausmo ir bendros sveikatos vertinimo; išsiskyrusių – fizinio aktyvumo, skausmo ir bendros sveikatos; našlių – socialinės funkcijos, energingumo / gyvybingumo, skausmo ir bendros sveikatos vertinimo srityse, tačiau išsiskyrusių grupėje nustatytas neigiamas poveikis blogiau vertinti veiklos apribojimą dėl emocinių problemų ($\bar{S}S_p - 3,45$). Pensininkams ($\bar{S}S_p - 2,09-39,75$) ir neįgaliesiems ($\bar{S}S_p - 2,61-71,70$) nustatytas stiprus ir labai stiprus neigiamas ryšys su visomis gyvenimo kokybės sritimis.
2. Amžius ir kūno masės indeksas nėra tokie svarbūs veiksniai, kurie lemtų gyvenimo kokybę, nes kūno masės indekso tik su keturiomis iš dešimties gyvenimo kokybės sričių (socialinės funkcijos, emocinės būsenos, fizinės sveikatos ir psichinės sveikatos) nustatytas silpnas teigiamas ryšys ($\bar{S}S - 0,91-0,96$). Rūkymas yra susijęs su blogesniu energingumo / gyvybingumo vertinimu ($\bar{S}S_p - 1,78$), o nustatytas rūkymo teigiamas poveikis veiklos apribojimo dėl emocinių problemų ir bendros sveikatos vertinimui galėtų būti susijęs su geresne tiriamųjų sveikata.

3. Ligos trukmė susijusi su blogesniu visų (ŠSp – 4,19-6,61) gyvenimo kokybės sričių, išskyrus veiklos apribojimo dėl emocinių problemų, emocinės būsenos ir psichinės sveikatos, vertinimu. Komplikacijos turėjo neigiamą poveikį veiklos apribojimo dėl emocinių problemų (ŠSp – 5,45), energingumo / gyvybingumo (ŠSp – 5,10), psichinės sveikatos (ŠSp – 3,41), emocinės būsenos (ŠSp – 2,73), socialinės funkcijos (ŠSp – 1,79) ir fizinės sveikatos (ŠSp – 1,79) GK sritims, hipertenzija turėjo neigiamą poveikį visoms (ŠSp – 1,78-2,99), išskyrus energingumo / gyvybingumo ir psichinės sveikatos, sritims.
4. Peroralinis gydymas teigiamai veikė veiklos apribojimą dėl emocinių problemų, skausmą ir psichinę sveikatą, tačiau turėjo stiprų neigiamą poveikį – vertinant emocinę būseną (ŠSp – 14,39). Gydymas insulinu teigiamai įtakoją vertinant: veiklos apribojimą dėl emocinių problemų ir psichinę sveikatą, tačiau neigiamai veikė vertinat emocinę būseną, skausmą ir fizinę sveikatą (ŠSp – 3,95-14,39). Mitybos pakeitimas ne toks svarbus veiksnys, kuris įtakotų gyvenimo kokybę, nes neigiamą poveikį turėjo tik emocinei būsenai, o fizinis aktyvumas yra svarbus veiksnys geriau vertinti emocinę būseną, skausmą ir psichinę sveikatą (ŠSp – 0,44-0,50).
5. Vyriška lytis, aukštesnis išsilavinimas, priklausymas vedusių, išsiskyrusių ir našlių grupei turėjo teigiamą, o amžius, priklausymas tarnautojų ir neįgaliųjų grupei – neigiamą poveikį depresinei būsenai. Vyriška lytis ir priklausymas našlių grupei turėjo teigiamą, o amžius, priklausymas tarnautojų grupei – neigiamą poveikį nerimo būsenai. Kūno masės indeksas ir rūkymas neturėjo poveikio nei depresinei, nei nerimo būsenai.
6. Depresinę būseną neigiamai veikė: ligos trukmė (ŠSp – 1,69-3,58), komplikacijos (ŠSp – 1,54), hipertenzija (ŠSp – 1,8) peroralinis gydymas (ŠSp – 3,71) ir gydymas insulinu (ŠSp – 4,08). Teigiamą poveikį depresinei būsenai turėjo mitybos pasikeitimas susirgus cukriniu diabetu. Nerimo būseną neigiamai įtakoją peroralinis gydymas, o gydymas dieta, mitybos pasikeitimas susirgus cukriniu diabetu (ŠSp – 0,24) turėjo teigiamą poveikį nerimo būsenai. Sergamumas arterine hipertenzija, fizinio aktyvumo pasikeitimas nustačius cukrinį diabetą ir rūkymas neturėjo poveikio nei depresinei, nei nerimo būsenai.

Praktinės rekomendacijos

Vykdyti pirminę 2-ojo tipo cukrinio diabeto profilaktiką, tikslinga mokyti visuomenę, ypatingą dėmesį skirti sveiko gyvenimo būdo propagavimui, aiškinti veiksnius, kurie didina riziką susirgti cukriniu diabetu, kad būtų galima sumažinti sergamumą šia liga. Ypač didelį dėmesį atkreipti į esančiuosius rizikos grupėje.

Mokyti sergančiuosius cukriniu diabetu sveikos gyvensenos – atsisakyti žalingų įpročių, aiškinti apie sveikos mitybos, fizinio aktyvumo naudą sveikatai, siekiant sergantiems išvengti ar sumažinti lėtinį cukrinio diabeto komplikacijų, kurios yra vienas iš pagrindinių veiksnų, bloginančių sergančiųjų 2-ojo tipo cukriniu diabetu gyvenimo kokybę ir emocinę būseną.

Be to, rekomenduojame atkreipti dėmesį į sergančiųjų 2-ojo tipo cukriniu diabetu emocinę būseną. Nerimo ir depresijos vertinimo (angl. *Hospital Anxiety and Depression – HAD*) skalė yra patogus ir greitas būdas vertinti nerimą ir depresiją, todėl gydytojai ir sveikatos priežiūros specialistai galėtų ją naudoti ne tik cukriniu diabetu, bet ir kitomis lėtinėmis ligomis sergančiųjų emocinei būsenai vertinti.

Rengiant cukrinio diabeto programas, tikslinga atsižvelgti į amžiaus, socialinių veiksnių, ligos trukmės, komplikacijų, hipertenzijos, mitybos ir fizinio aktyvumo įtaką gyvenimo kokybei ir emocinei būsenai.

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