Life satisfaction and other determinants of eating behaviours among women aged 40-65 years with type 2 diabetes from the Krakow population

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Abstract

Introduction: A rational dietary model is one of the key aspects in the treatment of type 2 diabetes.

Aim of the study: The study aimed to analyse the frequency of consuming selected groups of food products among women aged 40-65 years with type 2 diabetes, depending on age, BMI, duration of disease, and level of life satisfaction.

Material and methods: The study was carried out among 276 women using the author's specially designed questionnaire (metric data, duration of diabetes) and the Satisfaction with Life Scale (SWLS). We assessed BMI values on the basis of measurements of somatic indicators (body mass and height). Statistical analysis was performed using Pearson's r and Spearman's R correlation coefficients via the SPSS programme (significance level of $\alpha = 0.05$).

Results: Among the women with type 2 diabetes we observed nutritional deficiencies, in particular a low frequency of consuming the recommended product groups (vegetables, fruit, legume seeds, whole-grain cereals, dairy products with reduced fat content, and nuts). The scale of rational dietary choices among women increased along with age and perceived life satisfaction. As the time from diagnosis passed, this scale decreased. A decrease was also noted along with the increase in BMI.

Conclusions: The frequency of consuming some product groups shows a significant relationship with age, BMI, duration of disease, and the level of life satisfaction among women aged 40-65 years with type 2 diabetes.

Key words: type 2 diabetes, eating behaviours, women, life satisfaction, physical activity.

Introduction

In the complex aetiopathogenesis of non-insulin-dependent diabetes mellitus (T2DM), a key role, in addition to genetic factors, is played by behavioural conditions, including improper diet and low levels of physical activity, promoting obesity and insulin resistance [1, 2]. Excessive body mass also increases the risk of developing other health threats, including metabolic syndrome and its complications [1, 3-10]. Epidemiological studies have proven that one of the groups at increased risk of degenerative diseases, including metabolic ones, are women of menopausal age [11, 12].

Achieving the goals of diabetes treatment, including balancing carbohydrate metabolism, lipid profile normalisation, maintenance of normal blood pressure, and proper body mass, are conducive to pro-health behaviours, as well as rational dietary choices and physical activity [13-21]. Primary and secondary prevention of type 2 diabetes is supported by a diet rich in high-density foods, including vegetables and fruits, whole-wheat cereals, dairy products with reduced fat content, fish and vegetable oils, and nuts, with the restriction of animal fats, red meat, highly-processed cereals, as well as sweet and salty snacks [17]. An important element of therapeutic treatment in type 2 diabetes is a diet with the restriction of easily digestible carbohydrates, high IG products. An aspect of therapy for type 2 diabetes is also recreational physical activity, which improves energy balance, promotes body mass reduction, and further optimises blood lipid profile and carbohydrate metabolism, reducing health risks associated with obesity and diabetes [22]. American research has confirmed that the explanation for the highest number of deaths due to diet-related cardiometabolic reasons could be high intake of sodium and low consumption of nuts, highly processed meat, fish and seafood (omega-3), and fruit and vegetables [23].

Pro-health behaviours, including those related to nutrition, are determined by a broad spectrum of socio-economic, cultural, and personality-dependent factors [24, 25]. One of the personal resources associated with human health culture is sense of life satisfaction, understood as a subjective indicator of quality of life, or otherwise, as a cognitive aspect of satisfaction from life, which determines the degree of positively valuing life, i.e. to what extent a given person has satisfied his/her aspirations [25]. Previous studies have shown relationships between the level of life satisfaction and the dietary behaviours of women at perimenopausal age [26, 27], including hypertension [28]. Within this context, research was undertaken on the predictive role of sense of life satisfaction in relation to the dietary choices of women with type 2 diabetes.

Assuming the stance that in the treatment of diabetes, in addition to the use of hypoglycaemic medications (or less often, insulin), an important role is played by a pro-health lifestyle, including rational dietary choices and undertaking recreational physical activity, research was carried out regarding nutritional behaviours and their selected determinants among women aged 40-65 years with diagnosed type 2 diabetes mellitus. Our study aimed to analyse the frequency of consuming selected groups of food products (recommended and contraindicated) depending on age, duration of disease, BMI index, and the level of life satisfaction among women aged 40-65 years with type 2 diabetes from the Krakow population.

Material and methods

Execution of the study was among a group of 276 women aged 40-65 years (47.92 ±5.53) from the Krakow population with diagnosed type 2 diabetes. The author's specifically created validated questionnaire on the frequency of consuming selected groups of food products was used during the research. The frequency of consumption of product groups was assessed on an ordinal scale from 1 to 7 (1: never, 2: once a month, 3: several times a month, 4: 2-3 times a week, 5: 4-6 times a week, 6: once a day, and 7: several times a day). In the interpretation of average values of the frequency of consuming 22 particular food products, we adopted the following ranges: several times a day (7.00-6.50), once a day (6.49-5.50), 4-6 times a week (5.49-4.50), 2-3 times a week (4.49-3.50), several times a month (3.49-2.50), once a month (2.49-1.50), and never (1.49-1.00). The demographic part of the questionnaire included questions about the following: age, place of residence, other comorbidities, how to control glycaemia (hypoglycaemic agents vs. insulin), declared compliance with medical recommendations, health self-assessment, and duration of diabetes (seven questions in total). The standardised Satisfaction with Life Scale (SWLS) by Diener, Emmons, Larsen, and Griffin and later adapted by Juczyński was used to measure the cognitive aspect of satisfaction from life [25]. The SWLS, containing five statements with a seven-degree answer scale (1 – "I totally disagree"; 7 – "I totally agree"), is constructed in such a way that the higher the test result (within the range of 5-35 points), the higher the sense of life satisfaction. The reliability of the scale totals 0.81. The BMI value of women was assessed on the basis of somatic indicator measurements (body mass and height) using standard measuring tools (Tanita TBF-300P electronic scale and anthropometric altimeter). Anthropometric measurements were performed in the morning, in fasting state. The research was carried out, taking the standards of the Declaration of Helsinki into account, after obtaining the informed consent of the studied women. The original questionnaire and test results were administered by the authors of the work.

Women with diabetes declared co-occurrence of other chronic diseases, such as: hyperlipidaemia (56.5%), hypertension (46.0%), obesity (53.3%), hypothyroidism (21.7%), coronary heart disease (6.2%), and osteoporosis (5.1%). They rated their health as average (49.3%) and good (44.9%), but rarely as very good (2.5%) or poor (3.3%). Women mostly took oral hypoglycaemic drugs (79.3%) to regulate blood glucose level, and less often, insulin. 35.1% of the studied women declared strict adherence to medical recommendations.

Statistical analysis was conducted using Pearson's *r* and Spearman's *R* rank correlation via the SPSS programme, assuming a statistical significance level of $\alpha = 0.05$.

Data distribution in terms of demographic and somatic characteristics and other variables explaining the frequency of consuming certain products among women with type 2 diabetes is presented in Table 1.

Results

Correlation analysis showed that along with the age of the studied women, there was an increase in BMI index, duration of diabetes, and level of life satisfaction. We observed a positive correlation between the duration of the disease and the BMI index. In addition, along with the increase in BMI index and the duration of diabetes, a decrease in the level of life satisfaction of the examined women occurred ($p < 0.01$) (Table 2).

Assessment of the frequency of consuming selected groups of food products has shown that women with type 2 diabetes most often (daily, Me = 7) drink mineral water. At a rate of 4-6 times a week (Me = 5), they consumed: various vegetables, green vegetables, fruit, pork, and poultry. Usually, 2-3 times a week (Me = 4), they consumed: light cereal products, semi-skimmed or low-fat milk and cottage cheese, eggs, and butter. Frequently, i.e. several times a month (Me = 3), the following were included in the diet: legume seeds, whole-

Table 1. Characteristics of the group of women under study in terms of demographic and somatic features, duration of disease, and level of life satisfaction (descriptive statistics)

Variables	Descriptive statistics			
	Minimum	Maximum	M	SD
Age (years)	40.00	65.00	47.92	5.52
Body mass (kg)	59.00	120.00	75.84	13.63
Body height (cm)	154.00	190.00	168.33	8.43
BMI (kg/m^2)	21.00	44.07	26.71	4.14
Satisfaction with life (SWLS)	10.00	30.00	20.78	5.31
Duration of diabetes (time from diagnosis/years)	1.00	23.00	7.45	4.92

M – arithmetic mean, SD – standard deviation

Table 2. Relationships between independent variables included in the study (Pearson's *r* correlation coefficients)

Variables	Pearson's *r*			
	Age	BMI	Duration of diabetes	SWLS
Age	1	0.327**	0.372**	0.159**
BMI		1	0.239**	−0.235**
Duration of diabetes			1	−0.220**
Satisfaction with life (SWLS)				1

**Significant correlation at the level of *p* < 0.01 (two-sided)

Table 3. Frequency of consuming selected groups of food products among women aged 40-65 years with type 2 diabetes (descriptive statistics)

Food products	Descriptive statistics						
	M	SD	Me	Min	Max	Q25	Q75
Vegetables	5.18	1.37	5.00	2.00	7.00	4.00	6.00
Green vegetables	4.69	1.34	5.00	1.00	7.00	4.00	6.00
Legume seeds	3.13	1.58	3.00	1.00	7.00	2.00	4.00
Fruit	4.81	1.60	5.00	1.00	7.00	4.00	6.00
Whole-wheat products	3.66	1.70	3.00	1.00	7.00	3.00	5.00
White whole-wheat products	4.46	1.81	4.00	1.00	7.00	3.00	6.00
Whole-fat milk and cottage cheese	3.08	1.91	3.00	1.00	7.00	1.00	4.00
Semi-fat or skimmed milk and cottage cheese	3.76	1.68	4.00	1.00	7.00	3.00	5.00
Yellow cheeses	3.39	1.70	3.00	1.00	7.00	2.00	4.50
Eggs	3.70	1.32	4.00	1.00	6.00	3.00	5.00
Sea fish	3.30	1.32	3.00	1.00	7.00	2.00	4.00
Meat, pork cold-cuts	4.71	1.59	5.00	2.00	7.00	3.00	6.00
Meat, poultry cold-cuts	4.42	1.61	5.00	1.00	7.00	4.00	5.50
Butter	4.21	2.17	4.00	1.00	7.00	2.00	6.00
Nuts, almonds	3.46	1.91	3.00	1.00	7.00	2.00	5.00
Margarines with plant sterols	3.58	2.27	3.00	1.00	7.00	1.00	6.00
Fast foods / salty snacks	2.89	1.67	3.00	1.00	7.00	1.00	4.00
Sweets, pastries	3.13	1.89	3.00	1.00	7.00	2.00	4.00
Sweetened sodas	3.36	1.94	3.00	1.00	7.00	2.00	5.00
Fruit juices	3.27	2.02	3.00	1.00	7.00	1.00	5.00
Mineral water	5.52	1.93	7.00	1.00	7.00	5.00	7.00
Alcoholic beverages	2.14	1.32	2.00	1.00	7.00	1.00	2.00

M – mean, SD – standard deviation, Me – median, min – minimum, max – maximum, Q25 – lower quartile, Q75 – upper quartile

wheat products, whole-fat milk and cottage cheese, yellow cheeses, sea fish, nuts, margarine with plant sterols, fast foods, sweets and pastries, sweetened sodas, and fruit juices. Women usually reached for alcoholic beverages once a month (Me = 2) (Table 3).

Analysis of correlations between the examined variables and the frequency of consuming certain groups of food products showed that with increasing age, the frequency of consuming the following products also increased: green vegetables ($p < 0.001$), fruit ($p < 0.001$), yellow cheeses ($p < 0.01$), nuts ($p < 0.001$), and soft margarines with plant sterols ($p < 0.05$), while the rate of consumption decreased in the case of: legume seeds ($p < 0.001$), whole-fat milk and dairy products ($p < 0.001$), eggs ($p < 0.001$), poultry meat and cold-cuts ($p < 0.001$), butter ($p < 0.01$), fast foods ($p < 0.001$), sweetened sodas and fruit juices ($p < 0.05$), as well as alcoholic beverages ($p < 0.01$).

As the time from diagnosis passed, the frequency of consuming the following products increased: legume seeds ($p < 0.05$), whole-fat milk and dairy products ($p < 0.001$), yellow cheeses ($p < 0.001$), pork meat and cold-cuts ($p < 0.05$), sweets ($p < 0.01$), fast foods ($p < 0.001$), and alcoholic beverages ($p < 0.01$), while the rate of consuming the following decreased: green vegetables ($p < 0.05$), fish ($p < 0.05$), nuts ($p < 0.05$), and mineral water ($p < 0.05$).

As BMI increased, the frequency of consuming the following increased: yellow cheeses ($p < 0.05$), butter ($p < 0.05$), vegetable margarines ($p < 0.001$), sweets ($p < 0.01$), sweetened sodas ($p < 0.001$), and fruit juices ($p < 0.01$), while the frequency of consuming these products decreased: whole-fat dairy products ($p < 0.001$), semi-skimmed dairy products ($p < 0.01$), and mineral water ($p < 0.05$).

Along with the increase in the level of life satisfaction, the frequency of consuming the following increased: vegetables ($p < 0.001$), legume seeds ($p < 0.001$), fruit ($p < 0.01$), whole-wheat products ($p < 0.001$), semi-skimmed and low-fat dairy products ($p < 0.001$), sea fish ($p < 0.001$), nuts ($p < 0.001$), and mineral water ($p < 0.001$), while the frequency of consuming these products decreased: white whole-wheat products ($p < 0.001$), yellow cheeses ($p < 0.001$), pork ($p < 0.001$) and poultry ($p < 0.05$) meat and cold-cuts, butter ($p < 0.001$), margarine ($p < 0.001$), sweets ($p < 0.001$), fast foods ($p < 0.001$), sweetened sodas ($p < 0.001$), fruit juices ($p < 0.05$), and alcoholic beverages ($p < 0.01$) (Table 4).

Discussion

This research has shown nutritional deficiencies and the relationship between age, duration of disease, BMI, and the level of life satisfaction as well as the rate of consuming certain groups of food products among women aged 40-65 years with type 2 diabetes. We also demonstrated that the increase in BMI along with age and duration of the disease was associated with a decrease in the level of life satisfaction, thus confirming the gradual decline in the quality of women's life in the course of diabetes.

An essential part of the therapeutic process in diabetes is dietotherapy, which aims at improving metabolic rates, glycaemic control, optimisation of lipid profile and blood pressure, as well as improvement in overall health and quality of life [19]. In diabetes, nutrition similar to the Mediterranean nutrition model is recommended, with a high share of vegetables and fruits, whole-grain cereals, fish, olive oil, and nuts, and low consumption of animal fats and red meat [17, 22, 29]. Meanwhile, among women with type 2 diabetes, nutritional deficiencies have been found, particularly regarding the low frequency of consuming recommended products with high nutrient density, including: vegetables, fruit, legume seeds, whole-wheat cereals, dairy products with reduced fat content, and nuts. This can result in a reduced supply of dietary fibres, antioxidants, and group B vitamins as well as calcium and unsaturated acids, thus increasing the risks to health.

A key aspect of dietary diabetes therapy is avoiding products with high glycaemic index and instead favouring products with medium and low GI [30, 31]. The basis of the diet, in addition to whole-wheat cereal products, should be vegetables and fruit, low-glycaemic sources of insoluble and soluble fibre fractions, including pectin reducing postprandial glycaemia and improving blood lipid profile, as well as bioactive substances, including antioxidants (vitamin C, carotenoids, polyphenols) [32]. In other studies, for example, among American patients, inadequate intake of fruit and vegetables among diabetic patients has also been described (five portions of vegetables and fruit accounted for only 26% of people), similarly as in our study [16]. A low intake of vegetables was also demonstrated in another Polish study among diabetic patients, in which only 8.2% of patients with type 1 diabetes consumed them several times a day [33]. Also, in another study it was found that fruit was consumed by 18% of women with type 2 diabetes more often than once a day [34]. Insufficient frequency of vegetable consumption (68% daily) and fruit (85% daily) was also described among patients with type 2 diabetes treated at clinics in the Małopolska region [35]. The cited studies correspond to the results of studies among people with metabolic syndrome, who also had deficiencies in dietary fibre [36].

In rational nutrition for people with diabetes, both animal products (lean meat, fish, and skimmed dairy products) as well as foods from plants (legume seeds) are recommended as a source of protein. In our research, among the dairy products, patients more often chose products with reduced fat content, but at a similar frequency, they reached for white and red meat. Fish was usually selected several times a month, which may lower the supply of omega 3 PUFAs, playing an essential role in optimising

Table 4. Correlations between age, BMI, duration of disease, level of life satisfaction, and the frequency of consuming food groups among women aged 40-65 years with type 2 diabetes (Spearman's R coefficient)

Food products	Spearman's R			
	Age	BMI	Duration of illness	SWLS
Vegetables	0.020	−0.246***	−0.111	0.553***
Green vegetables	0.267***	−0.095	−0.130*	0.479***
Legume seeds	−0.198***	−0.106	0.143*	0.216***
Fruit	0.528***	0.088	−0.081	0.154**
Whole-wheat products	−0.077	−0.053	−0.066	0.322***
White whole-wheat products	0.061	−0.080	0.084	−0.334***
Whole-fat milk and cottage cheese	−0.271***	−0.198***	0.999***	−0.067
Semi-fat or skimmed milk and cottage cheese	0.095	−0.181**	−0.029	0.239***
Yellow cheeses	0.170**	0.168**	0.235***	−0.291***
Eggs	−0.295***	−0.040	−0.095	0.105
Sea fish	0.081	−0.026	−0.130*	0.259***
Pork meat and cold-cuts	0.021	0.073	0.142*	−0.461***
Poultry meat and cold-cuts	−0.190***	0.080	−0.083	−0.149*
Butter	−0.180**	0.126*	−0.107	−0.325***
Nuts, almonds	0.279***	0.069	−0.127*	0.235***
Margarines with plant sterols	0.134*	0.206***	0.043	−0.320***
Fast foods / salty snacks	−0.208***	0.067	0.181**	−0.313***
Sweets and pastries	−0.118	0.170**	0.214***	−0.318***
Sweetened sodas	−0.140*	0.322***	0.033	−0.200***
Fruit juices	−0.128*	0.177**	−0.059	−0.124*
Mineral water	−0.027	−0.143*	−0.141*	0.305***
Alcoholic beverages	−0.163**	−0.082	0.161**	−0.161**

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$ (two-sided significance)

the lipid profile of the blood. A different study suggests compounds of vitamin D deficiency (its source is sea fish) with the risk of type 2 diabetes [37] and indicated the likelihood of vitamin D deficiency, among others, in patients with diabetes [38]. The importance of dairy products is related to the supply of calcium, and one Korean study has shown a negative correlation between calcium intake and the incidence of type 2 diabetes [39]. In another investigation among women with type 2 diabetes from Małopolska, consumption of pork was observed in 23%, poultry meat in 62%, and fatty sausages in 13% of patients [35].

Improvement in metabolic parameters, including the lipid profile of the blood, is favoured by a diet with restriction of saturated fatty acids [5]. Meanwhile, in our research, more frequent consumption of animal fats (butter) than vegetable oils (nuts and soft margarine) was found. An additional study among diabetic patients in Krakow also showed more frequent consumption of animal than vegetable fat, lack of interest in the fat content of products (32.0%), and not restricting products containing cholesterol (80.0%) [40]. Meanwhile, studies have shown a relationship between eating butter and fatty cheeses and the risk of developing diabetes [41].

Avoiding sweets, pastries, and sweetened sodas, as recommended in diabetic nutrition, is justified by the need to significantly reduce the intake of simple sugars, high index glycaemic products, as well as trans-unsaturated fatty acid isomers. The research confirmed a relationship between the consumption of sweetened beverages, metabolic syndrome, and type 2 diabetes [42, 43]. The literature on the subject confirms the high prevalence of consuming sweets and pastries in various groups of diabetic patients. Regular consumption of sweets was demonstrated in the group of patients with type 1 and type 2 diabetes, with an indication to reach for sweets at most, several times a month (42.8% with type 1 diabetes and 62.9% with type 2 diabetes). Patients also consumed these products more often, i.e. several times a week (34.7% with type 1 diabetes and 22.2% with type 2 diabetes) and daily (20.4% with type 1 diabetes and 7.4% with type 2 diabetes) [33]. Increased consumption of sweets was also described among the Małopolska group of diabetic patients [15, 44, 45]. Non-consumption of sweets was declared by only 18% in the case of another group of women with diabetes from Małopolska [35]. Alcohol contraindicated for people with diabetes was usually consumed sporadically, which

should be assessed positively because alcohol increases the risk of glycaemic deregulation [46].

The discussed research among women with type 2 diabetes also showed statistically significant relationships between age, duration of disease, BMI, and level of life satisfaction, as well as the frequency of consuming certain groups of food products. The observed trends were not entirely unambiguous but showed a specific direction. With increasing age, the frequency of consuming recommended products (including green vegetables and fruits, nuts, and margarine with plant sterols) increased, while the frequency of consuming non-recommended products (including fast foods, sweetened sodas) decreased, which may indicate an increase in health consciousness regarding the significance of rational dietary choices for health. In turn, with the duration of the disease, there was a tendency towards less intensive rational food choices. The rate of consuming products rich in saturated fatty acids (e.g. high-fat dairy products, pork, and cold-cuts), simple sugars, and trans isomers (sweets, fast foods) increased, and the frequency of consuming the recommended products decreased (green vegetables, fish, nuts), which may indicate a decrease in motivation to make rational dietary choices in the course of the disease. Improper dietary choices in the course of diabetes may limit the effectiveness of therapy and increase the risk of complications, which corresponds to health risks that occur in addition to diabetes (excessive body mass, hyperlipidaemia, hypertension, etc.). Different studies among adults have also shown differences in preferences and eating habits depending on age, in such a way that they could be a factor influencing the increase in BMI and adipose tissue as well as the risk of metabolic diseases (lipid and carbohydrate), with co-existing obesity [47]. Studies conducted in the Polish population (subjects above the age of 20) in 2013-2014 as part of the WOBASZ II programme confirmed the prevalence of metabolic disorders among women, including hypercholesterolaemia (55.3%), hypertension (41.7%), diabetes (9.6%), and obesity (27.2%) as well as nutritional deficiencies related to them [48].

The relationships between the frequency of food consumption and BMI demonstrated in the discussed research, indicating positive BMI correlations with the frequency of consuming, among others: yellow cheeses, butter, sweets, and sweetened sodas, confirmed the participation of high energy density products in the development of excessive body mass. The consumption of products with a high content of saturated fatty acids (yellow cheeses and butter) and simple sugars (sweets and carbonated beverages) may increase the energy intake in the food rations as well as the risk of developing excessive body mass (and an increase in BMI). The correlations between high consumption of sweetened sodas and the development of overweight and obesity has been confirmed in epidemiological and clinical studies [43, 49]. Another study also confirmed the importance of environmental (low physical activity and nutritional errors) and socio-economic (easy access to cheaper, highly processed, and high-calorie foods) factors in the development of overweight and obesity [50].

The discussed research also showed a tendency to increase the scale of rational food choices along with the increase in the level of life satisfaction; in particular, related to the more frequent consumption of recommended products, including: vegetables, legume seeds, fruit, whole-wheat cereals, skimmed dairy products, sea fish, and nuts, and less frequent consumption of less-recommended products, including: light cereals, pork meat and cold-cuts, sweets, fast food, sweetened sodas, and alcoholic beverages. These behaviours fit into the list of rational dietary choices, favouring the balance of carbohydrate metabolism and optimising the lipid profile of the blood, due to the functional properties of the nutrients contained in them. The proven regularities, indicating a more rational model of nutrition for people with a high level of life satisfaction, are justified by the characteristics of this dimension. A high level of life satisfaction, i.e. the cognitive aspect of satisfaction from life, is a vital health resource that stimulates pro-health behaviours, also within the field of balanced nutrition [25]. The relationships indicated in the discussed studies can be explained by the relationships between more rational dietary choices and the improvement of health, which indirectly translates into better quality of life (and a higher level of life satisfaction) and higher motivation to make more beneficial food choices by women with higher life satisfaction. The trends described in our research also refer to the results of other studies, including among women at perimenopausal age [26-28]. Correlations between life satisfaction and some health determinants, including nutrition, have also been confirmed in Chilean research [51]. A high level of the sense of life satisfaction seems to be an important personal resource conducive to ongoing health care, including more rational dietary behaviours of women with diabetes, which is all the more important because the recommended dietary restrictions (limitations) affect the quality of life of women with type 2 diabetes [52]. In addition, type 2 diabetes generally negatively affects the quality of life of patients, to a greater extent in women than in men [53].

Conclusions

Among women with type 2 diabetes mellitus, the found nutritional deficiencies regarded, in particular, insufficient frequency of consuming certain recommended groups of food products, including vegetables, fruit, legume seeds, whole-wheat cereals, low-fat dairy products, and nuts, which can lower the nutritional value and pro-health diet.

Among women with type 2 diabetes, we found significant relationships between age, duration of disease, BMI, and the level of life satisfaction, as well as the frequency of consuming certain groups of food products.

The scale of rational dietary choices among women with type 2 diabetes increased along with age and feeling of life satisfaction, and decreased from time of diagnosis and along with the increase in BMI.

In the health education of women with type 2 diabetes, conducive to the optimisation of therapeutic procedures, factors conditioning dietary choices, including age, time from diagnosing the disease, BMI, and life satisfaction, should be taken into account.

Disclosure

The authors report no conflict of interest.

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