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THE LEVEL OF DISEASE ACCEPTANCE IN PATIENTS WITH TYPE 2 DIABETES DURING HOSPITALIZATION AND SELECTED SOCIO-DEMOGRAPHIC AND MEDICAL FACTORS

Poziom akceptacji choroby u pacjentów z cukrzycą typu 2 podczas hospitalizacji a wybrane czynniki społeczno-demograficzne i medyczne

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Abstract (in Polish):

Cel pracy

Określenie znaczenia wybranych czynników społeczno-demograficznych i medycznych dla akceptacji choroby wśród pacjentów z cukrzycą typu 2 leczonych w szpitalu.

Materiał i metody

Dorośli pacjenci (100) z cukrzycą typu 2 wypełnili zwalidowaną samoopisową skalę akceptacji choroby (AIS) oraz autorski kwestionariusz socjodemograficzny. Dane medyczne, takie jak: poziom glikohemoglobiny (HbA1c), BMI, okres choroby, aktualne leczenie, obecne powikłania cukrzycy zostały zaczerpnięte z dokumentacji medycznej pacjentów.

Wyniki

W badanej grupie średni poziom akceptacji choroby według skali AIS wyniósł 24,77 pkt. Akceptacja choroby zależy od aktualnie stosowanego leczenia i niektórych powikłań cukrzycy występujących u pacjentów. W badanej grupie nie stwierdzono istotnego związku między miejscem zamieszkania a poziomem wykształcenia pacjentów i ich akceptacją choroby, natomiast ich stan cywilny wpływał na poziom akceptacji choroby. Kobiety w badanej grupie nie różnią się istotnie od mężczyzn pod względem akceptacji choroby, obecności powikłań cukrzycy, BMI i poziomu glikohemoglobiny, ani te dwie ostatnie nie wykazują żadnego związku z akceptacją choroby, natomiast związek można zaobserwować w odniesieniu do czasu trwania choroby.

Wnioski

W opiece i działaniach terapeutycznych podejmowanych wobec pacjentów z cukrzycą typu 2 można rozważyć intensyfikację wsparcia dla pacjentów z cukrzycą od dłuższego czasu, owdowiałych, leczonych insuliną, z powikłaniami takimi jak: udar mózgu, nefropatia, Amputacja stopy i kończyny cukrzycowej.

Abstract (in English):

Aim

The level of disease acceptance in patients with type 2 diabetes during hospitalization and selected socio-demographic and medical factors

Material and methods

Adult patients (100) with type 2 diabetes, completed the validated self-reports Acceptance of Illness Scale (AIS) and authors'socio-demographic questionnaire. The medical data such as: the level of glycohemoglobin (HbA1c), BMI, period of illness, present treatment, present diabetes complications were taken from the patients' medical documentation.

Results

In the studied group the average level of illness acceptance according to the AIS scale was 24.77 pts. The acceptance of illness depends on the currently received treatment and some diabetes complications present in the patients. In the group there was no significant relationship between the place of living and the level of education of the patients and their level of illness acceptance, while their marital status affected the level of illness acceptance. The women in the studied group do not differ in a significant way from men in terms of their illness acceptance, presence of diabetes complications, BMI and the level

of glycohemoglobin, neither do the two latter show any relation to the illness acceptance, while such a relation can be noticed with regard to the illness duration.

Conclusions

In therapeutic care and activities undertaken with respect to patients with type 2 diabetes, it is possible to consider the intensification of support for patients suffering from diabetes for a long time, widowed, treated with insulin, with complications such as: cerebral stroke, nephropathy, diabetic foot and limb amputation.

Keywords (in Polish): pacjent, szpital, Cukrzyca typ 2, przewlekle chory.

Keywords (in English): patient, hospital, chronically ill, Type 2 diabetes.

Short title
Poziom akceptacji pacjenta z cukrzycą a wybrane zmienne

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Authors (short)
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According to WHO Global Report on Diabetes in 2014 there were 422 million adults with diabetes all over the world. The rate of patients with diabetes in the population has nearly doubled since 1980 from 4.7% to 8.5%. The numbers also reflect the increase of diabetes-related risk factors, such as overweight and obesity. WHO claims that a vast majority of patients with diabetes suffer from type 2 diabetes and, importantly, type 2 diabetes has always been associated with the adult population, while nowadays, due to the popular unhealthy lifestyle, mostly lack of physical activity as well as overweight and obesity, it increasingly affects also the child population [1]. The global diabetes prevalence in 2019 is estimated to be 9,3% (463mln people) rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045 [2]. For the European continent it will be 6.9% of the European population. Thus diabetes is now and will become in the future both a serious health problem and a social and economic problem for societies around the globe. According to the International Diabetes Federation 10% of all health-related expenditure, i.e. 760 billion USD, are expenses linked to diabetes [3].

Therefore, its appearance should definitely be counteracted through effective education of societies as well as preventive healthcare. There should also be undertaken activities that would support patients in

the process of learning how to live with the chronic disease and to adapt to the illness. From the point of view of the patient's health, the most beneficial is positive attitude of the patient towards his/her disease, defined as acceptance of illness/adapting to illness, due to which an individual adapts a rational approach to his/her disease-related limitations and cooperates with people supporting him/her in the course of the disease, including healthcare professionals [4]. The reaction of a patient to appearance of the illness and his/her future life with it is a complex process which changes over the time and can be different with different patients. A true and objective assessment of mental and social functioning of a patient, especially in case of a chronic illness, makes it possible to monitor the process and support the patient in his/her adapting to the illness. At the same time such assessment, made by care professionals, will allow for choosing directions of such care optimum for the patient and based on test results (Evidence Based Medicine). This will enable a more effective use the resources involved in the care process, including the financial resources.

Research design and methods
Study sample

The studied group were patients hospitalized in one of academic clinical center in capital city of Poland. The inclusion criterion was a diagnosed type 2 diabetes, patients' age over 18 and ability to read and write in Polish. Type 2 diabetes patients' participation in the study was voluntary and anonymous, adult patients aged over 18 were asked for their consent to participate in the study. The patients were informed that the data they supply will only be used for the purposes of the scientific work. The consent was given by 100 people, including 50 women and 50 men, who then completed the study questionnaires, necessary data connecting with illness were taken from the patients' medical documentation. The study was conducted in the period from June to September 2018.

Measures

The study involved surveying a group of patients with type 2 diabetes in relation to the level of illness acceptance displayed by them as well as certain chosen medical and non-medical factors. In the literature there are studies of the relationship between illness acceptance and quality of life in case of chronic diseases and the influence of socio-demographic factors on acceptance of illness. However, there are few studies that would analyze the influence of factors related to the disease itself, such as complications, the treatment method or anthropometric and laboratory indicators of the patients, on the level of their adaptation to the illness. For assessing the level of illness the Acceptance of Illness Scale (AIS) toll was used – developed by B.J. Felton, T.A. Revenson and G.A. Hinrichsen. The scale is used for studying adult ill patients. It contains eight statements describing the negative consequences of poor health. The scale is used to measure the degree of disease acceptance. It can apply to any disease. The minimum number that can be obtained is 8 points, while the maximum scale value is 40 points. The greater the acceptance of the disease, the better the adaptation and the less sense of mental discomfort. The reliability of AIS in the Polish version of the scale is similar to the original one and was checked by Zygfryd Juczyński and associates(5). For collecting the socio-demographic and also medical data the authors' questionnaire was used which consisted of a part completed by the patient and a part completed by the researcher from the patient's medical documentation. This questionnaire includes: main socio-demographic factors (age, sex, place of residence, patients' education and marital status) and medical data such as: illness duration,

glycohemoglobin level-result during hospitalization, body weight, height (BMI), current treatment and the present diabetes complications.

Ethical approval

Conducting questionnaire, retrospective and non-invasive research did not require the opinion of the bioethics committee. The consent to conduct the study was obtained from the SPCSKAM Directorate in Warsaw. The work was written on the basis of the research carried out in accordance with the Helsinki declaration

Data analysis

In order to characterize a typical value of quantitative features an arithmetic mean (*M*) was calculated, while as the dispersion value standard deviation (*SD*) was adopted. In order to present the position of observation, quartile measure (*Q1, Mdn, Q3*) was used. The conformity of quantitative features' distribution with normal distribution was assessed by means of the Shapiro-Wilk test. In the statistical study both parametric and non-parametric methods were used. The comparison of quantitative variables dispersion in two groups was performed with use of Student's t-test for independent samples or Mann-Whitney U test. For comparison of quantitative variables dispersion in more than two groups the one-way ANOVA analysis of variance or ANOVA on ranks by Kruskal-Wallis was used. For assessing the equality of variances in the samples the authors used the Levene's test. Respectively, when variances were homogenic Bonferroni post hoc test for multiple comparisons was used, while with other variances – Games-Howell post hoc test for multiple comparisons. In order to study the correlation between pairs of variables, the Spearman's rho rank correlation was employed. When interpreting the strength of the correlations the following classification was adopted: $|r| \geq 0.8$ – very strong correlation, $0,6 \leq |r| < 0.8$ – strong correlation, $0.4 \leq |r| < 0.6$ – mild correlation, $0.2 \leq |r| < 0.4$ –weak correlation, $|r| < 0.2$ – very weak correlation.

A statistical analysis of differences in contingency tables for qualitative features was made with use of Pearson's chi-squared test (χ^2 test). For all the analyses the maximum allowable type I error $\alpha = 0.05$ was adopted, while statistically significant is $p \leq 0.05$. The analysis was made with use of Statistica version 10.

Results
Socio-demographic characteristic of the sample.

The studied group consisted of 100 people: 50% women and 50% men. The vast majority of the respondents were aged 56-75 (55%), 10% were younger patients aged 18 to 45, 16% were patients aged 46 to 55, while older people from 76 to over 85 made up 19%. In the studied group most people (36%) had secondary school education (vocational education - 28%, post-secondary school education -14%, primary school education -6%, higher education -16%). More than half of all respondents (56%) were retired (31% were people in active employment, 12% were on a disability pension, 1% were students). Most of the respondents (39%) have had type 2 diabetes for less than 5 years (7% for 5-10 years, 13% for 10-15 years, 19% for 15-20 years, 9% for 20-25 years and 25-30 years, 4% for 30-35 years). Most of the patients lived in the capital city of Poland - 59% (10% in towns with population of 50-100 thousand, 9% lived in rural

areas, and 7% in towns with population up to 50 thousand). More than half of the respondents (57%) were formally married (23% were widows/widowers, 12% were divorced, 8% were single).

Illness characteristic of the sample:

Nearly half of the respondents (45%) used insulin therapy, oral medication was taken by 60% of patients, while pharmacological treatment was also supported by non-pharmacological treatment (77%). A large majority of type 2 diabetes patients suffered from eye diseases (retinopathy) affected 51% of the respondents, while kidney damage (nephropathy) was diagnosed in 43% of the patients. A similar percentage of patients suffered from diabetic foot and had heart attack –31% and 29% respectively. Moreover, among diabetes complications, the patients also suffered from coronary heart disease (23%), cerebral stroke (18%) and limb amputation (8%). During the hospitalization the level of glycohemoglobin in the studied group varied from 47.91 mmol/mol; (6,53%) to 87.78 mmol/mol (10.18%), while the mean level in the hospitalized patients was M=62.83 mmol/mol (7.9%) with standard deviation of SD=3.08 mmol/mol (2.43%).

The respondents weighed from 67 to 148 kilo, the mean body weight of the respondents was M=102 kg, with standard deviation SD=18 kg. The respondents were 156 to 192 cm tall, with the mean height of M=172 cm, where standard deviation was SD=7 cm. The minimum BMI level of respondents was 24.06, and the maximum was 53,71. The mean BMI level for the respondents was M=34.53, with standard deviation SD=5.89. The mean BMI value in the studied group situates it in the category of obesity [6].

Illness acceptance in the studied group.

The lowest level of illness acceptance measured with the use of the Acceptance of Illness Scale (AIS) in the studied group was 8 pts, while the highest – 40 pts (out of maximum 40 points), the mean illness acceptance level of the respondents, measured with the AIS was M=24.77 pts with the standard deviation SD=10.03 pts. The mean illness acceptance level of women measured with the AIS was 23,84pct., while the mean AIS's score for men was 25,70pct (women in the examined group are not significantly different from men in terms of the level of disease acceptance (Z=0.87; p>0.05)). The most numerous group among the respondents were people characterized by medium level of illness acceptance (42%). More than one-third of all the respondents (35%) had high level of acceptance for their illness, while nearly one-fourth of the respondents (23%) did not accept their illness.

Step 1. Sociodemographic factors and illness acceptance.

Among sociodemographic potential factors only marital status influences the attitude to the disease. Kruskal-Wallis test analysis showed statistically significant variations between the groups in the scope of the examined variable: H (3,N=100)=24.23; p<0.001; E^2=0.24. (Table 1). Post-hoc multiple comparisons demonstrated that single people have statistically higher level of acceptance according to the AIS than widowed people (p<0.001), than divorced (p=0.003), and than people in an official relationship (p=0.041) (Diagram 1). What is more, people in an official relationship (married) have higher level of disease acceptance according to the AIS than widowed people (p=0.007).

There is no significant relationship between the place of residence (r_s=0,12, p=0,237) and patients'education (r_s=0,12, p=0254) and the illness acceptance level. Women in the examined group (as mentioned above) are not significantly different from men in terms of the level of disease acceptance (23,84 pct. v 25,70 pct., Z=0.87; p>0.05).

Table 1. Marital statAus vs. the level of illness acceptance according to AIS.

Variable	Marital status	n	$\bar{r}$	Q_1	Mdn	Q_3	Min	Max	M	SD	H	p
Illness acceptance (AIS)	Single	8	85.13	35	39.50	40	23	40	36.50	5.90	24.23	<0.001
	Married	57	55.47	20	26	35	10	40	26.53	9.14		
	Widow/ widower	23	32.09	11	16	25	8	37	18.39	8.50		
	Divorced	12	39.08	11.50	21	28.50	9	37	20.83	9.71		

Note. n – number; – mean rank; Q_1 – first quartile; *Mdn* – median; Q_3 – third quartile; *Min* – minimum value; *Max* – maximum value; *M* – mean; *SD* – standard deviation; *H* – Kruskal-Wallis test result; *p* – significance level for test statistics.
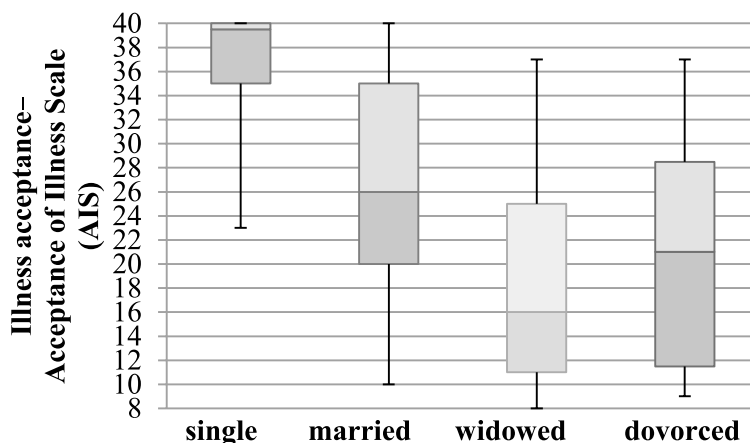

Diagram 1. The level of acceptance according to the Acceptance of Illness Scale for people of different marital status.

Step 2. Illness factors and illness acceptance

We found that illness duration has statistically significant relationship to acceptance of illness such that the longer was the patient suffering from type 2 diabetes, the lower was his/her illness acceptance level according to the AIS: r_s=-0.62; $p < 0.001$. The power of correlation is strong $(0.6 < |r| < 0.8)$.

In the studied group there are statistically significant differences for higher acceptance of illness level (AIS) in patient that have not undergone insulin therapy in comparison to patients who received such treatment (Z= 3.87; $p < 0.001$; r_g=0.45) (Diagram 2).
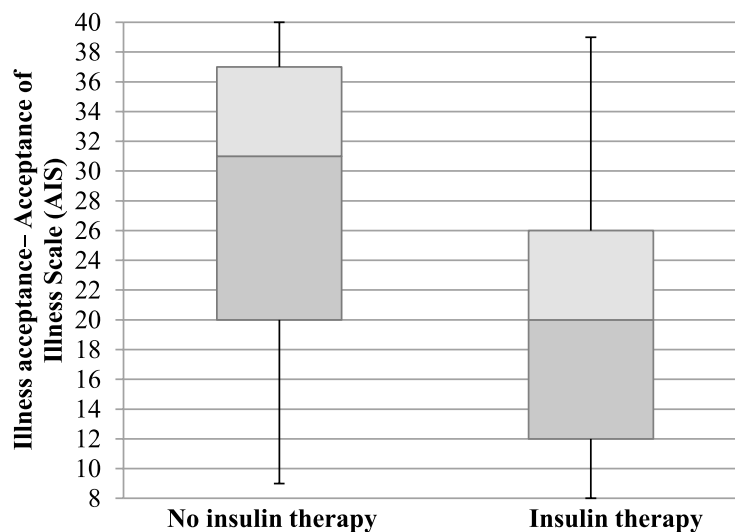

Diagram 2. Acceptance of illness level according to the AIS scale among patients with and without the insulin therapy

In the studied group also there were found statistically significant differences in the scope of illness acceptance according to the AIS scale for such complications as: cerebral stroke – stroke patients had lower levels of acceptance than people who did not have the complication (Z = 3.87; p < 0.001; r_g = 0.58); nephropathy – people with this complication had a lower level of acceptance than those not suffering from the complication; (Z = 3.65; p < 0.001; r_g = 0.43); diabetic foot – patients with the diabetic foot had a lower level of illness acceptance than those not suffering from the complication (Z = 6.57; p < 0.001; r_g =0.82); limb amputation – patients after a limb amputation had a lower level of illness acceptance than those not suffering from the complication (Z = 4.26; p < 0.001; r_g = 0.91) (Table 2).

Table 2. Chosen diabetes complications and comorbidities vs. acceptance of illness level according to the AIS scale.

Diabetes complications		Acceptance of illness – Acceptance of Illness Scale (AIS)										Z	p
		n	$\bar{r}$	*R*	Q_1	*Mdn*	Q_3	*Min*	*Max*	*M*	*SD*		
Cerebral stroke	No	82	55.75	4571.50	20	26.50	35	8	40	26.56	9.82	**3.87**	**<0.001**
	Yes	18	26.58	478.50	11	16.50	20	9	30	16.61	6.29		
Kidney damage (nephropathy)	No	57	59.69	3402.50	20	30	37	9	40	27.98	9.88	**3.65**	**<0.001**
	Yes	43	38.31	1647.50	13	20	26	8	37	20.51	8.62		
Heart attack	No	71	53.58	3804.50	18	26	36	8	40	25.86	10.77	1.66	0.096
	Yes	29	42.95	1245.50	15	23	28	9	36	22.10	7.41		
Coronary heart disease	No	77	51.81	3989.00	17	24	34	9	40	25.21	10.30	0.82	0.410
	Yes	23	46.13	1061.00	18	24	30	8	38	23.30	9.10		
Eye diseases (retinopathy)	No	49	50.21	2460.50	15	25	34	9	40	24.59	10.30	0.10	0.923
	Yes	51	50.77	2589.50	18	24	33.50	8	40	24.94	9.86		
Diabetic foot	No	69	63.27	4365.50	24	31	36	9	40	29.20	8.44	**6.57**	**<0.001**
	Yes	31	22.08	684.50	10.50	13	19.50	8	24	14.90	4.94		
Limb amputation	No	92	54.14	4981.00	19	26	34.50	9	40	26.03	9.43	**4.26**	**<0.001**
	Yes	8	8.63	69.00	9	10	11	8	14	10.25	1.91		

Note. n – number; – mean rank; *R* – sum of ranks; Q_1 – first quartile; *Mdn* – median; Q_3 – third quartile; *Min* – minimum value; *Max* – maximum value; *M* – mean; *SD* – standard deviation; *Z* –Mann-Whitney test result; *p* – significance level for Z test.

There was no statistically significant relationship between the level of glycohemoglobin in the respondents and their level of illness acceptance according to the AIS during the hospital stay (r_s=0.18; p=0,078). There was also no statistically significant relationship between the level of BMI in the respondents and their level of illness acceptance (r_s=-0,04, p=0,668) according to the AIS.

Step 3. Next we examined if men in studied group are different than women in relation to existing complications and comorbidities. Results for women and men were not significantly different in terms of diabetes complications and comorbidities (Table 3). Women also did not differ from men in terms of other illness factors such as: glycohemoglobin during the hospital stay t(97) = 0.33, p=0,740; mean difference *M* = 0.09; *SE* = 0.26 was statistically insignificant. Neither were such differences found for the BMI in relation to patient's sex (t=1,61; p=0,112).

Life with a chronic disease, such as type 2 diabetes, requires patients' self-discipline in everyday application of recommendations on pharmacological and non-pharmacological therapy they need to undergo. Patients' activities must be supported every day because they are often crucial for the level of progress/severity of the disease. Keeping good health condition as long as possible to minimize and/or

Table 3. Sex vs. chosen diabetes complications and comorbidities.

Diabetes complications		Sex				Total		χ^2	p
		female		male					
		n	% of the group	n	% of the group	n	% of the group		
Cerebral stroke	No	42	84.00	40	80.00	82	82.00	0.27	0.603
	Yes	8	16.00	10	20.00	18	18.00		
	Total	50	100.00	50	100.00	100	100.00		
Kidney damage (nephropathy)	No	27	54.00	30	60.00	57	57.00	0.37	0.545
	Yes	23	46.00	20	40.00	43	43.00		
	Total	50	100.00	50	100.00	100	100.00		
Heart attack	No	37	74.00	34	68.00	71	71.00	0.44	0.509
	Yes	13	26.00	16	32.00	29	29.00		
	Total	50	100.00	50	100.00	100	100.00		
Coronary heart disease	No	35	70.00	42	84.00	77	77.00	2.77	0.096
	Yes	15	30.00	8	16.00	23	23.00		
	Total	50	100.00	50	100.00	100	100.00		
Eye diseases (retinopathy)	No	21	42.00	28	56.00	49	49.00	1.96	0.161
	Yes	29	58.00	22	44.00	51	51.00		
	Total	50	100.00	50	100.00	100	100.00		
Diabetic foot	No	35	70.00	34	68.00	69	69.00	0.05	0.829
	Yes	15	30.00	16	32.00	31	31.00		
	Total	50	100.00	50	100.00	100	100.00		
Limb amputation	No	47	94.00	45	90.00	92	92.00	0.14	0.712
	Yes	3	6.00	5	10.00	8	8.00		
	Total	50	100.00	50	100.00	100	100.00		

Note. n – number; χ^2 –chi-squared test results; *p* – significance level for the χ^2 test.

postpone the occurrence of potential complications connected with the disease is the objective of the efforts taken by the patients, their families and health care specialists. In the process of struggling with a disease, especially a chronic disease, various stages occur, one of them being disease acceptance that enables and supports coping with the disease [5].

In the studied group the level of acceptance of the disease was on average 24.77 points (in the scale from 8 to 40), which places it around the middle value of the AIS scale. A similar range of average results (with a higher mean result, however) was obtained in case of type 2 diabetes in other authors' studies in reference to type 2 diabetes patients, for example: Kurpas at al. [7] 29, Stefańska at al. 27.5 [8], Pantlinowska at al. 26.78 [9], Kurowska at al. 25.16 [10] or Lewko at al. 29.5 [11].

In the study the analysis of 2 potential groups indicated in source literature as determinants of the level of disease acceptance was planned, i.e.: socio-demographic and medical factors. Among the socio-demographic factors are: sex, age, education, marital status, and place of residence. Sex in the sample group was not a factor differentiating the disease acceptance level results. Neither were such differences in reference to sex found in the following research works: Olszak at al. [12], Juzwiszyn at al. [13], Andruszkiewicz at al. [14], Cybulski et al. [15], or Rogon at al. [16]. In the research of Bąk at al. [17] the differences in disease acceptance by men and women were described as insignificant. Whereas in Pantlowska's studies [9], women aged up to 40 and 51-60, living in cities, with higher education showed

higher level of disease acceptance. In the research of Kurpas at al. [7] men showed higher level of disease acceptance than women (average number of points was 30 *vs* 28 for women). A higher level of disease acceptance is also reported by Stefańska et al. [8] and Haor et al. [18], who also report the significance of living in a city. Higher results in the AIS scale in reference to education are indicated by Kurowska et al. [10], which is not confirmed by Olszak et al. [12]. In this study neither place of residence nor education showed any relationship to the disease acceptance.

In the author's own research, patients 'marital status had significant influence on the obtained results of disease acceptance. In the studied group single people had higher level of disease acceptance than the widowed, the divorced, and people in official relationships. What is more, people in official relationship (married) had higher level of illness acceptance according to the Acceptance of Illness Scale (AIS) than the widowed ones. In the research of Olszak et al. [12] the respondents' marital status did not affent patients' acceptance of the disease. However, in the research of Haor et al. [18] patients with higher education, married, and living with their families, showed higher level of illness acceptance.

The age in the studied group was not the factor that influenced the disease acceptance, which confirms Kurowska et al. [10], but is not confirmed by, for example, Kurpas et al. [7], Olszak et al. [12], Haor et al. [18], Rogon et al. [16], or Andruszkiewicz et al. [14].

The factor connected with the disease that had an influence on the disease acceptance in the author's own research is the duration of the illness, which was confirmed in other research Kurowska et al. [10], Haor et al. [18], or Olszak et al. [12] related to patients with type 2 diabetes, in the same manner as in the present study, namely: the longer the duration of the disease, the lower the level of the disease acceptance.

In the group of medical factors analysed, the following ones were included: currently applied treatment (non-pharmacological treatment, oral medicines, insulin therapy), and the occurrence of main diabetes complications, including: cerebral stroke, nephropathy, coronary heart disease and heart attack, retinopathy, diabetic foot, and amputation of limbs. It turns out that in the studied group the following factors had an important influence on the level of disease acceptance: currently applied pharmacological treatment and some diabetes complications. In reference to the applied treatment, in case of insulin therapy patients declared a significantly lower level of disease acceptance than patients in which this form of treatment was not applied. Data from other studies also confirm that the application of insulin therapy is connected with lower level of disease acceptance among patient with type 2 diabetes Haor et al. [18], Kurpas et al. [7], Olszak et al. [12]. The prevalence of diabetes and quantity of insulin use in the population of patients with diabetes in Poland is reported by Śliwczyński et.al. [19] and Czeleko et al. [20]. Among diabetes complications, the greatest influence on lowering the level of disease acceptance had the following ones: cerebral stroke, kidney damage (nephropathy), diabetic foot, and limb amputation. Lower level of disease acceptance, according to the AIS scale in patients with complicated diabetes, is also indicated by Kurpas et al. [7], whereas Rogon et al. [16] notice that the threat of diabetes complications may be the factor lowering the level of disease acceptance among the patients with type 2 diabetes. A large number of such complication in the Polish population of patients with diabetes is reported in the studies by Wierzba et.al. [21,22,23].

Similarly like in Olszak at al. [12], we did not manage to show, on the basis of authors' own research, that BMI and the level of glycohemoglobin are of significance for the results obtained with the use of AIS. Despite the fact, the average results in the studied group indicating that overweight and obese people as well as the ones whose level of blood glucose in recent weeks on average exceeded the limit show some tendencies in the studied group. In her studies, Kurpas et al. [7] showed diversity of the results of disease acceptance for patients with correct body weight, overweight and obese, while the level of glycohemoglobin in the studies, similarly to Olszak et al. [12] and this study, was not confirmed.

In the care and therapeutic activities directed at type 2 diabetes patients, it is recommended to assess the level of their adaptation to the illness, which may help the team of experts in establishing holistic approach to activities related to the planned care and therapy processes. When taking care of patients, we should consider providing more support for activities directed at long-term patients, widowed patients (lacking support from close relatives), as well as those undergoing insulin therapy with such complications as: cerebral stroke, nephropathy, diabetic foot and limb amputation.

Conclusions

1. Type 2 diabetes patients with an average level of disease acceptance predominate in the study group.
2. The method of treatment significantly influences the level of acceptance of the disease in the examined people. Patients treated with insulin accept their disease to a lesser extent than patients who are not treated with insulin.
3. The level of disease acceptance in the respondents depends on some of their diabetes complications, such as: stroke, nephropathy, arterial hypertension, diabetic foot and limb amputation.
4. There is no significant relationship between the place of residence, education and marital status of sick people and the level of acceptance of the disease.
5. Widowed people show a lower level of disease acceptance than other groups of patients.
6. The level of the BMI index and the level of glycosylated hemoglobin do not correlate with the acceptance of the disease. There is a relationship between the duration of the disease, people who are ill for longer have a lower level of disease acceptance.
7. There are no statistically significant differences between men and women in terms of disease acceptance and diabetes complications, as well as BMI and glycosylated hemoglobin levels.
8. In the care and therapeutic activities undertaken in relation to patients with type 2 diabetes, consideration should be given to strengthening the activities in relation to patients who are chronically ill, widowed (possible lack of support from a loved one) and treated with insulin.
9. Consideration should be given to strengthening the measures in relation to patients with complications such as: stroke, nephropathy, hypertension, diabetic foot and limb amputation.

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