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Dominika Żądło[1,B-D], Bożena Kowalczyk[2,A-B,E-F]

IMPACT OF DISEASE ACCEPTANCE ON THE QUALITY OF LIFE OF PATIENTS WITH DIABETES DURING THE COVID-19 PANDEMIC

Wpływ akceptacji choroby na jakość życia pacjentów z cukrzycą w czasie pandemii COVID-19

[1]Psycholog, Przedszkole Językowe z oddziałami terapeutycznymi, Polska
[2]Health Institute, Podhale State Collage of Applied Sciences in Nowy Targ, Polska

A - Koncepcja i projekt badania, B - Gromadzenie i/lub zestawianie danych, C - Analiza i interpretacja danych, D - Napisanie artykułu, E - Krytyczne zrecenzowanie artykułu, F - Zatwierdzenie ostatecznej wersji artykułu

Dominika Żądło - 0000-0003-3736-9808
Bożena Kowalczyk - 0000-0001-9800-9561

Abstract (in Polish):
Cel pracy
Celem badań była ocena stopnia akceptacji choroby i poziomu jakości życia osób z cukrzycą ze wskazaniem zależności korelacyjnych w czasie trwania pandemii Covid-19.

Materiał i metody
W badaniu udział wzięło 115 chorych na cukrzycę, przebywających w poradni diabetologicznej. W celu zgromadzenia materiału badawczego wykorzystano polską wersję standaryzowanego kwestionariusza

WHOQOL-Bref oraz Skalę Akceptacji Choroby (AIS). Zebrane dane poddano analizie statystycznej w programie SPSS Statistics 27.0. We wszystkich obliczeniach za poziom istotności przyjęto $p < 0.05$.

Wyniki

Stwierdzono istotne statystycznie, dodatnie i umiarkowanie silnie korelacje między akceptacją choroby a zadowoleniem z jakości życia ($r \leq 0,37$) oraz jakością życia w sferze socjalnej ($r \leq 0,36$) i środowiskowej ($r \leq 0,43$) . Natomiast istotne statystycznie, dodatnie i silne korelacje stwierdzono między akceptacją choroby a zadowoleniem ze swojego zdrowia ($r \leq 0,52$) i jakością życia w sferze somatycznej ($r \leq 0,67$) i psychologicznej ($r \leq 0,52$) co oznacza, że wyższa akceptacja choroby związana jest z wyższą jakością życia osób chorych na cukrzycę.

Wnioski

Cukrzyca jako przewlekła choroba metaboliczna jest tak powszechna na świecie, że została uznana za jedno z największych wyzwań w globalnej opiece zdrowotnej i społecznej. Akceptacja choroby ma ogromne znaczenie dla jakości życia osób z cukrzycą, co pozytywnie wpływa na wszystkie badane sfery jakości życia oraz zadowolenia z jakości życia i zdrowia. Pacjenci z cukrzycą w okresie pandemii COVID-19 to osoby o istotnie przeciętnym poziomie akceptacji choroby.

Abstract (in English):

Aim

The aim of the study was to assess the degree of disease acceptance and the level of quality of life of people with diabetes, indicating correlations during the prevailing COVID-19 pandemic.

Material and methods

The study involved 115 diabetic patients awaiting an appointment at a diabetes clinic. The Polish version of the standardized WHOQOL-Bref questionnaire and the Acceptance of Illness Scale (AIS) were used to collect the research material. The data was statistically analyzed in SPSS Statistics 27.0. In all calculations, the level of significance was $p < 0.05$.

Results

Statistically significant, positive, and moderately strong correlations were found between acceptance of the disease and satisfaction with the quality of life ($r \leq 0.37$) and quality of life in the social ($r \leq 0.36$) and environmental ($r \leq 0.43$) spheres. On the other hand, statistically significant, positive, and strong correlations were found between acceptance of the disease and satisfaction with one's health ($r \leq 0.52$) and quality of life in the somatic ($r \leq 0.67$) and psychological ($r \leq 0.52$) spheres, which means that higher acceptance of the disease is associated with a higher quality of life for people with diabetes.

Conclusions

Diabetes has been recognized as one of the greatest challenges in global health and social care. The acceptance of the disease is of great importance for the quality of life of people with diabetes, which has a positive effect on all examined spheres of quality of life and satisfaction with the quality of life and health. Patients with diabetes during the COVID-19 pandemic are people with a significantly average level of disease acceptance.

Keywords (in Polish): jakość życia, akcpetacja choroby, cukrzyca, COVID-19.

Keywords (in English): quality of life, illness acceptance, diabetes, COVID-19.

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Short title
Akceptacja choroby a jakość życia pacjentów z cukrzycą

Corresponding author
Dominika Żądło
Psycholog, Przedszkole Językowe z oddziałami terapeutycznymi, Polska; email: dominika.zadlo@interia.pl Phone: 795400744

Authors (short)
D. Żądło, B. Kowalczyk

Introduction

At the beginning of 2020, the world was faced with a terrifying outbreak of severe acute respiratory syndrome coronavirus (SARS-CoV-2). Providing an adequate medical care in all aspects, including diabetic care, while maintaining social distance, proved to be a challenge during the Covid-19 pandemic [1,2]. The continuous increase has been observed in worldwide incidence of chronic illnesses, one of them being diabetes that increases the risk of coronary heart disease, stroke and hypertension [3,4]. In 2010, WHO expected the number of adults aged 20 years and older living with diabetes to rise to 300 million in 2025 [3] and indicated diabetes as a major health problem that is considered not only an economic burden on the healthcare system, but, most importantly, a factor that leads to a decrease in satisfaction with quality of life of patients and their families [5]. However, data from International Diabetes Federation (IDF) demonstrates that the worldwide number of diabetic patients aged 20-79 as of January 1, 2018 exceeded 425 million, over 463 million people are now estimated to be living with diabetes and by 2045 this number is expected to rise to 629 million [6,7,8]. In Poland, over 2 million people aged 20-79 were affected by diabetes in 2017 [9]. At present, around 2,6 million people in Polish society (i.e. almost 7% of the total population of Poland) have diabetes, yet the actual number of patients is underestimated as it includes only identified and reported cases [10]. An essential element of diabetic care is assessing psychoemotional state of people living with diabetes and their attitude towards living with illness [11]. Chronic illnesses result in lower quality of life as they are a source of negative experiences [12]. Quality of life has long been of interest in medical science as an element for assessing consequences of medical conditions as well as assessing medical and non-medical effects of health care and medical interventions [13]. Lack of illness acceptance has a negative impact on quality of life and overall health [9]. The higher quality of life with illness can be observed in patients who accept their illness [14]. Holistic approach to patient care requires coordinated actions of medical staff, families and the patients themselves. The actions should be accompanied by an effective social campaign aimed at increasing public awareness of risks

and symptoms of diabetes [14,15]. The study of quality of life (QOL) in diabetic patients should be considered an essential component of diabetic care as diabetes, like any other chronic disease, is burdened with many complications causing the patient to experience dysfunctions in biological, psychological and social domain [14]. At present, information on this matter in relevant literature is scarce which may result from difficulties in conducting studies in close contact during the pandemic.

The aim of the study was to determine the correlation between the degree of illness acceptance and quality of life during the COVID-19 pandemic.

Material and methods

The study group consisted of 115 people with clinically diagnosed diabetes. The study was carried out between January and June 2021 among patients treated at a diabetes outpatient clinic; however, due to the pandemic, many appointments took place online and therefore it was possible to conduct research only on a rather small group. Inclusion criteria for the study were as follows: an informed consent expressed in the presence of the person conducting the study, an ability to fill out a diagnostic survey, diabetes duration (>1 year), 18 years of age and above.

The diagnostic survey method was applied for the purposes of this study. In order to collect research material, an original survey, an analysis of medical records and a questionnaire with a standardized scale were used. The instrument that was applied to assess the quality of life was the Polish version of the standardized WHOQOL-Bref questionnaire developed by Laura Wołowicka and Krystyna Jaracz. It comprises 26 questions and the response to each item is scored on a scale from 1 to 5. The score denoting overall quality of life consists of individual's satisfaction with their health and quality of life and the scores for each domain are scaled in a positive direction with higher scores indicating higher quality of life [16]. The raw WHOQOL-BREF score is expressed on a scale of 0-100 points. The Acceptance of Illness Scale (AIS), developed by Felton, Revenson and Hinrichsen and adapted to Polish conditions by Juczyński, was also used for the study. It contains 8 questions and the response to each item is scored on a scale from 1 to 5. The results obtained are then divided into three levels based on score: from 8 to 18 points - lack of acceptance, from 19 to 29 points - moderate acceptance, from 30 to 40 points - high illness acceptance. Low score indicates lack of acceptance and emotional problems related to illness. The scale is intended to measure illness acceptance in adults. The questionnaire is suitable to use in patients with any medical condition [11,17].

All statistical analyses were performed with SPSS 20. Variables measured on a quantitative scale were characterized with measures including mean and standard deviation, whereas qualitative variables measured on a nominal scale were represented by size and percentage. The analysis of collected data was performed using SPSS Statistics 27.0. A significance level of $p < 0.05$ was adopted in all analyses.

Results

Of the respondents, 67.83% had type 1 diabetes and 32.17% had type 2 diabetes. According to the data analysis, the mean age of the respondents was 39.38±16.99 years (between 18 and 88 years old). The most numerous group were the respondents aged 19 to 29 years (36.52%). The majority of the sample were women (77.39%). The most numerous group of the respondents were people with higher education (46.09%). The highest proportion of those surveyed (35.65%) were white-

collar workers. Married men and women (42.61%) constituted the largest percentage of the sample. Nearly 60% of the respondents lived in the urban area. The body mass index (BMI) was a factor differentiating between people with healthy weight (35.65%), overweight (30.43%), obesity (25.22%) and underweight (6.96%). In the survey on family history of diabetes, as many as 44.35% of the respondents reported having first-degree relatives (parents, sibling) and second-degree relatives (grandparents) with diabetes. A total of 23.47% of the respondents had a parent with diabetes (mother – 3.2%, father – 12.17%), 10.43% had an affected grandparent, 4.35% had an affected sibling, whereas 6.09% did not provide details concerning the affected family member (table 1).

Table 2 shows descriptive statistics and normal distribution of the analyzed variables, i.e. quality of life and illness acceptance. As the conducted study indicates, the respondents reported greater satisfaction with quality of life (Q1) 3,63±0,80 than with their health (Q2) 3,12±0,91 and thus the mean value of 3,12±0,91 was obtained. The overall analysis of quality of life domains on a 0-100 scale showed that the highest score was found for the social domain – mean 67.73, the physical domain was the second highest – mean 65.90, followed by the environmental domain – mean 65.62. The domain with the lowest score was the psychological domain – mean 55.53.

The collected data revealed that diabetic patients showed moderate level of illness acceptance (28,97±8,32). The presented values of skewness and kurtosis coefficients, not exceeding the range <-1; 1>, confirmed that the distribution of the results in terms of quality of life and illness acceptance was consistent with the normal distribution. The normal distribution and homogeneity of between-groups variance, confirmed with the Levene's test, constituted grounds for application of parametric methods despite unequal sizes of the compared groups. The Student's t-test for two independent samples and Pearson's correlation coefficient (Pearson's r) were used.

As demonstrated by the results presented in Table 3, the most numerous group were the respondents showing high level of illness acceptance (53.04%). Moderate illness acceptance level was found in 30.43% of the respondents. Low level of acceptance was observed in 16.52% of the participants.

Table 4 provides the Student's t-test statistics in which the independent variable was self-assessment of illness acceptance (yes vs. no) and the dependent variable was quality of life. Statistically significant between-groups differences were observed in terms of satisfaction with one's health and quality of life as well as in specific domains of quality of life, i.e. somatic, psychological, social and environmental domain. People who accepted their illness reported a significantly higher quality of life in all measured aspects than people who did not accept their illness.

Statistically significant between-groups differences in quality of life in environmental domain were observed. People with type 1 diabetes reported significantly higher quality of life in the respective aspect than people with type 2 diabetes. No significant between-groups differences were found in terms of individual's satisfaction with health and quality of life as well as quality of life in somatic, psychological and social domain. Worth noting, however, is a statistical tendency ($p < 0,10$) indicating that people affected by type 1 diabetes reported a greater satisfaction with general quality of life and in domains of quality of life, including the environmental domain, than people affected by type 2 diabetes (table 5).

Table 6 shows Pearson's r correlation matrix between illness acceptance according to the AIS and quality of life. Statistically significant, positive and moderately strong correlations between illness acceptance and satisfaction with quality of life as well as between social and environmental domains

were observed. Statistically significant, positive and strong correlations between illness acceptance and individual's satisfaction with their health and quality of life in somatic and psychological domain were also found, which indicates that higher acceptance of illness is associated with better quality of life.

Table 7 shows Student's t-test statistics in which the independent variable was a positive family history of diabetes (yes vs. no) and the dependent variable was illness acceptance measured with the AIS. No statistically significant between-groups difference was found in terms of illness acceptance assessed with the application of the AIS.

Discussion

Diabetes as a chronic metabolic illness is so prevalent worldwide that it is considered one of the biggest challenges in global health and social care [6].

Motyka K. and Stanisz-Wallisz K. in their study in which they analyzed quality of life among 300 diabetics obtained the best results in the social domain [18]. The authors' own research also found the quality of life to be the highest in the social domain (67.73±20.75) and the lowest in the psychological domain (55.53±18.37). The research conducted in Iran by Bijani M. et. al. among 200 people living with diabetes type 2 revealed that the highest quality of life based on WHOQOL-BREF was found in the environmental domain (56.50±11.07) and the lowest, as is the case in the authors' own research, in the psychological domain (53.83±12.71) [5]. In the research carried out by Ćaćić M. et. al. among 500 people with diabetes type 2 whose mean age was 62 years (35-90), the highest quality of life based on WHOQOL-BREF was obtained in the environmental domain, whereas in the social domain quality of life was found to be the lowest. In turn, Jalil A. et al. in their study analyzed life satisfaction among diabetic patients treated at the hospital in Pakistan in association with the disease management attitudes and nutritional status. The study conducted among 496 patients of the clinic in Pakistan revealed that as many as 64% of patients reported dissatisfaction with life with diabetes [19]. The results of own study were diametrically opposite with as many as 80% of the respondents claiming to accept their illness.

In the study performed by Kurpas D. et al. the mean score in accordance with the AIS was 29 points and 57% of the respondents reported high level of illness acceptance [20]. Olszak C. et al. conducted a study on a group of 227 people with type 2 diabetes who were admitted to the department of endocrinology at a teaching hospital and treated at a diabetes outpatient clinic and the obtained mean score based on the AIS was 27,21±7,88. The obtained results suggest moderate illness acceptance among the surveyed population of patients [11]. The results found in the authors' own study were similar (28,97±8,32) and indicated a moderate level of illness acceptance. High illness acceptance was reported by 53.04% of the respondents. In the present study, people who accepted their illness reported a significantly higher quality of life in all domains than people who did not accept their illness.

Motyka H. and Stanisz-Wallis K. in their assessment of quality of life in which they used WHOQOL-BREF questionnaire concluded that quality of life of the respondents was dependent on such factors as age, gender, professional activity, marital status and type of diabetes. Significant differences were found in the physical and psychological domains as well as in overall quality of life in favor of patients with type 1 diabetes, which, according to the researchers, resulted from the fact that patients with type 2 diabetes were older [18].The authors' own research indicated only

statistically significant differences in terms of satisfaction with individual's immediate environment (environmental domain) in favor of people affected by type 1 diabetes.

Kurpas D. et al. in their study reported higher level of illness acceptance which was associated with better quality of life and the determining factors included age and gender of the respondents [20]. In the research carried out on a group of 80 people diagnosed with type 2 diabetes, Pantlinowska D. et al. also found quality of life to be dependent on the degree of illness acceptance [14]. In analyzing the correlations between different aspects of quality of life and illness acceptance in own study, the strongest correlations were revealed between illness acceptance and satisfaction with one's health and quality of life in somatic and psychological domain. Patients who accept their illness are better adapted to living with diabetes and report a higher quality of life with chronic illness. Jalil A. et al. claim that full acceptance of illness guarantees high quality of life [19]. Achieving an optimistic outlook on life in people suffering from a chronic illness results in the acceptance of disability, which has a positive effect on motivating a person affected by diabetes to social activity that increases the quality of life. Holistic approach to patients' health issues contributes to recognizing importance of not only medical and functional assessment of the patients but also that of their subjective feelings and the studies conducted to date on quality of life and illness acceptance only provide evidence to support this notion [12].

Conclusions

Based on the conducted study, following conclusions can be drawn:

1. Half of the respondents with diabetes reported high level of illness acceptance. Despite a small number of diabetic patients showing low level of illness acceptance, it is necessary to continue to undertake educational actions and psychosocial interventions which will result in increase in the quality of life of the patients.
2. Positive family history of diabetes is not a determining factor; however, it is appropriate to develop and disseminate measures such as strategies of communication, education and advertising that are tailored to specific target groups, e.g. youth, working people or senior citizens and that take into consideration gender, age, etc.
3. Illness acceptance has a considerable influence on the quality of life of people affected by diabetes and has a positive effect on all analyzed domains of life and satisfaction with one's health and quality of life.
4. Diabetic patients showed moderate illness acceptance during the COVID-19 pandemic.

Table 1. Sociodemographic characteristics of the sample group.

Characteristic	Variable	In total	
		N	%
Gender	Female	89	77,39
	Male	26	22,61
Age	18	5	4,35
	19 – 29	42	36,52
	30 – 39	32	27,83
	40 – 49	18	15,65
	50 – 59	16	13,91
	≥ 60	7	6,09

Characteristic	Variable	In total	
		N	%
Marital status	single	41	35,65
	married	49	42,61
	widowed	5	4,35
	cohabitation	20	17,39
Education level	primary	5	4,35
	vocational	18	15,65
	secondary	39	33,91
	higher	53	46,09
Professional activity	blue-collar worker	25	21,74
	white-collar worker	41	35,65
	farmer	4	3,48
	pensioner	16	13,92
	unemployed	9	7,83
	other (student)	20	17,39
Place of residence	Rural area	46	40,00
	Urban area	69	60,00
Body mass index (BMI)	underweight	8	6,96
	healthy	41	35,65
	overweight	35	30,43
	obesity class I	23	20,00
	obesity class II	6	5,22
Family history of diabetes	Yes	51	44,35
	No	64	55,65

Table 2. Descriptive statistics and normal distribution of quality of life and illness acceptance

	N	Min	Max	M	SD	Skewness	Kurtosis
Individual's satisfaction with quality of life*	115	2.00	5.00	3.63	0.80	-0.16	-0.37
Individual's satisfaction with health*	115	1.00	5.00	3.12	0.91	-0.25	-0.46
Somatic (physical) domain	115	19.00	100.00	65.90	17.62	-0.42	-0.26
Psychological domain	115	13.00	94.00	55.53	18.37	-0.48	-0.46
Social domain	115	19.00	100.00	67.73	20.75	-0.23	-0.56
Environmental domain	115	25.00	94.00	65.62	14.25	-0.33	-0.29
Illness acceptance	115	8.00	40.00	28.97	8.32	-0.47	-0.80

* question 1. and 2. from WHOQOL BREF questionnaire, scores on a 1-5 scale;

N - population size, M - mean, SD - standard deviation, Min/Max - minimum/ maximum

Table 3. Illness acceptance level among the respondents (according to the AIS score ranges)

Acceptance level	Score	Population size (N)	%
Low	8-18	19	16.52
Moderate	19-29	35	30.43
High	30-40	61	53.04

Table 4. Correlation between quality of life and the respondent's subjective assessment of illness acceptance

Quality of life	Self-assessment of illness acceptance				Student's t-test statistics		
	Yes (n=92)		No (n=23)				
	M	SD	M	SD	t(115)	p	Cohen's d
Individual's satisfaction with quality of life*	4,00	1,00	3,00	1,00	2,82	0,01	0,53
Individual's satisfaction with health*	3,00	1,00	2,00	1,00	4,69	0,001	0,88
Somatic domain	68,00	18,00	57,00	15,00	2,80	0,01	0,53
Psychological domain	59,00	17,00	41,00	18,00	4,44	0,001	0,84
Social domain	71,00	20,00	56,00	19,00	3,01	0,001	0,57
Environmental domain	67,00	14,00	61,00	13,00	1,74	0,01	0,43

* question 1. and 2. from WHOQOL BREF questionnaire, scores on a 1-5 scale;
n-group size; M-mean; SD-standard deviation; t-Student's t-test statistics; p-significance level in the t-test; Cohen's d-effect size

Table 5. Correlation between quality of life according to WHOQOL-Bref and the respondents' type of diabetes

Quality of life	Type of diabetes				Student's t-test statistics		
	Type 1 (n=78)		Type 2 (n=37)				
	M	SD	M	SD	t(115)	p	Cohen's d
Individual's satisfaction with quality of life	4,00	1,00	3,00	1,00	1,81	0,07	0,34
Individual's satisfaction with health	3,00	1,00	3,00	1,00	1,21	0,23	0,23
Somatic domain	68,00	17,00	62,00	18,00	1,82	0,07	0,34
Psychological domain	56,00	18,00	55,00	19,00	0,07	0,94	0,01
Social domain	70,00	22,00	63,00	18,00	1,88	0,06	0,35
Environmental domain	68,00	13,00	60,00	14,00	3,17	0,001	0,60

* question 1 and 2. from WHOQOL BREF questionnaire, results presented on a 1-5 scale;
n-group size; M-mean; SD-standard deviation; t-Student's t-test statistics; p-significance level in the t-test; Cohen's d-effect size

Table 6. Correlation between illness acceptance and quality of life

Quality of life	Illness acceptance	
	r	p
Individual's satisfaction with quality of life	0.37	**0.001**
Individual's satisfaction with health	0.52	**0.001**
Somatic domain	0.67	**0.001**
Psychological domain	0.52	**0.001**
Social domain	0.36	**0.001**
Environmental domain	0.43	**0.001**

* question 1. and 2. from QHOQOL BREF questionnaire, scores on a 1-5 scale;
r - Pearson's r correlation coefficient, p – significance level of Pearson's r correlation

Table 7. Illness acceptance in relation to family history of diabetes

Illness acceptance according to the AIS	Family history of diabetes				Student's t-test statistics		
	Yes (n=51)		No (n=64)				
	M	SD	M	SD	t(115)	p	Cohen's d
	30,00	7,00	28,00	9,00	1,12	0,26	0,21

n-group size; M-mean; SD-standard deviation; t-Student's t-test statistics; p-significance level of the t-test; Cohen's d-effect size

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