

# Perceived quality of life and acceptance of illness in people with type 2 diabetes mellitus

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## Abstract

**Objectives:** Type 2 diabetes exerts a significant impact on the patient's quality of life. Its chronic nature, incurability and complications weaken the motivation of patients to fight the disease and its acceptance. The aim of research was to determine whether and to what extent diabetes modulates the quality of life of patients and in particular which domain of the patient's life is most limited. In addition, we looked at whether the quality of life perceived by patients is determined by gender and whether and to what extent they accept their illness.

**Material and methods:** A study on 100 patients with type 2 diabetes from the Wielkopolska region in Poland was carried out at the end of 2013/beginning of 2014 using a diagnostic survey, and the research techniques were a standardized questionnaire – ADDQoL19 (Audit of Diabetes-Dependent Quality of Life 19) and the AIS questionnaire (Acceptance of Illness Scale) developed by Felton and modified by Juczyński.

**Results:** The results suggest that the quality of life of the patients was "neither good nor bad", whereby women perceive it as being lower than men. While analysing the impact of diabetes on the different domains of the lives of men and women, it should be stressed that most affected were diet, satisfying appetite, independence, financial position, feelings about the future, sex life, and freedom in the consumption of drinks. More than half of men and women did not accept their illness; however, younger persons unlike older accepted diabetes to a much greater degree.

**Conclusions:** Type 2 diabetes negatively affects the quality of life of patients and its impact is felt more by women. In both sexes, the most affected domain of quality of life is the lack of nutritional freedom. The acceptance of illness is dependent upon age.

**Key words:** diabetes type 2, quality of life, illness acceptance, age.

## Introduction

The living conditions of many societies have over the years transformed in many ways [1]. The "Post-industrial" lifestyle, population growth, longer lifespan, and the spread of obesity and sedentary lifestyle in society promotes the spread of type 2 diabetes [2]. According to the International Diabetes Federation (IDF), the prevalence of people with diabetes in Poland in 2011 was 10.6% of the population, 1/3 of whom are not diagnosed [3]. Globally there were 285 million diabetes cases in 2010, and the prediction is that by 2030 this number will rise to 439 million [4]. Due to the chronic nature of diabetes and due to numerous complications, the disease invokes a series of disturbances in the mental and physical realm. In the initial stage, it is in a hidden form and therefore often at the time of diagnosis there are already dangerous complications. Diagnosis of the disease significantly affects the existing lifestyle and can lead to emotional changes, causing a deterioration in its quality. Although the

concept of quality of life is not strictly defined, it is an essential element of health. This means that, at the time of developing an illness, almost all aspects of life become dependent on health [5].

Research on the quality of life is the expression of a holistic approach to the patient and is important in dealing with chronically ill people. Beside the impact on survival time it provides valuable information, necessary for the implementation of new educational methods and treatment [6]. Measurement of the quality of life in diabetes mellitus broadens the perspective in which the patient is perceived, especially in terms of treatment recommendations, education and self-control [7].

We aimed to determine whether and to what extent diabetes modulates the quality of life and in particular which domain of the patient's life is most limited. In addition, we looked at whether the perceived quality of life is determined by gender and whether and to what degree the illness is accepted by the patient.

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## Material and methods

Surveys were carried out in the years 2013-2014 among a group of 100 patients with type 2 diabetes (54 women and 46 men) from the Wielkopolska region. Participation was voluntary and completely anonymous. The studies enrolled patients with a diabetes diagnosis at least one year old and with a level of glycated haemoglobin (HbA<sub>1c</sub>) over 6.5%.

Height and weight were measured with participants wearing light clothes and no shoes. Measurement was made in the morning, fasting, in the nurse's office. Body mass index (BMI) was calculated as weight (kg) divided by height (m) squared.

In the study, we used two types of surveys. For the assessment of the current quality of life of the patient we used the ADDQoL 19 questionnaire (Audit of Diabetes Dependent Quality of Life-19) [8]. It consists of two overview items: one measuring overall QoL and the second one dealing with a further 19 items concerning the impact of diabetes on specific aspects of life. The 19 life domains relate to: leisure activities, working life, travel, holidays, physical health, family life, friendships and social life, close personal relationships, sex life, physical appearance, self-confidence, motivation of accomplishments, people's reactions, feelings about the future, financial situation, living conditions, dependence on others, freedom to eat, and freedom to drink. The Cronbach's  $\alpha$  for the questionnaire is 0.85 [8].

The degree of acceptance of illness was evaluated by the AIS (Acceptance of Illness Scale) questionnaire developed by Felton *et al.* [9], and adapted to Polish conditions by Juczyński [10]. The questionnaire consists of 8 sentences with 5 choices per question and allows the evaluation of the degree of acceptance of illness by the patient on a scale from 8 to 40 points. A low score (8-29) indicates a low acceptance of the disease and a strong feeling of mental discomfort, high results (35-40) indicate full acceptance of the disease and a lack of negative feelings [10]. The Cronbach's  $\alpha$  for the polish version of the questionnaire AIS is 0.82.

**Table 1.** The overall quality of life of participants measured by ADDQoL questionnaire

	Women	Men	P value
	Percent (quantity)	Percent (quantity)	
As bad as it could possibly be	6 (3)	2 (1)	0.3181
Very bad	15 (8)	2 (1)	0.0237
Bad	13 (7)	2 (1)	0.0426
Neither good nor bad	33 (18)	31 (14)	0.8309
Good	24 (13)	29 (18)	0.1057
Very good	9 (5)	22 (10)	0.0694
As good as it could possibly be	0	2 (1)	0.2965

Each participant was informed about the purpose of the study. The study was conducted with consent of the interested parties and the study protocol was approved by the Ethics Committee at the Poznan University of Medical Sciences (Resolution number 946/14).

## Statistical analysis

For qualitative variables the Pearson  $\chi^2$  test for independence with simultaneous calculation of the Cramer V coefficient was used. This coefficient which assumes values from 0 to 1 additionally allows for additional ratings of the strength of the relationship and for comparison of several dependencies. Percentages were compared using U Mann-Whitney test for 2 structures coefficients.

Obtained results were statistically analysed using the Statistica software 10.0 (StatSoft, Tulsa, Oklahoma, USA). All hypotheses were evaluated at a significance level of  $p < 0.05$ .

## Results

The results of the study are presented in Tables 1-4 and Figures 1-3.

The age of patients ranged from 45 to 83 years. The mean age of women was 59.4  $\pm$ 10.55 years and men 59  $\pm$ 9.73 years. The mean weight for women was 78.4  $\pm$ 15.26 kg and for men 87  $\pm$ 15.78 kg, and the mean height were 165.1  $\pm$ 6.27 cm and 176.2  $\pm$ 7.39 cm respectively. The body weight measured by body mass index (BMI) indicates the presence of excess weight for both women (28.9  $\pm$ 6.41 kg/m<sup>2</sup>) and men (27.9  $\pm$ 4.09 kg/m<sup>2</sup>). Women and men were divided according to WHO criteria and based on Kvamme *et al.* [26]. The BMI in women under 65 years of age was 27.7  $\pm$ 0.92 in 31.2  $\pm$ 1.75 in men, respectively 27.7  $\pm$ 0.60 and 28.4  $\pm$ 0.77. Only in women these values differed significantly. Women had a significantly higher BMI compared to men ( $p < 0.0001$ ).

Most of the participants had a secondary education ( $n = 35\%$ ) or vocational education ( $n = 45\%$ ).

Table 1 shows the distribution of ratings of overall quality of life. 33% of the surveyed women and 31% of the surveyed men evaluated their quality of life as "neither good nor bad" and 39% of men and 24% of women identified it as "good".

There was a significant difference between women and men in the assessment of the quality of life as "very bad" and "bad". A tendency towards significant difference occurred also in the case of the evaluation of quality of life as "very good".

The answers to the question of the ADDQoL questionnaire: "How would your quality of life be if you did not have diabetes?" is presented in Fig. 1. For participants, had they not had diabetes, their quality of life

**Table 2.** The assessment of the degree of acceptance of illness based on the AIS questionnaire

AIS (points)	Women (n = 54)				Men (n = 46)			
	up to 65 year n (%)		over 65 year n (%)		up to 65 year n (%)		over 65 year n (%)	
Acceptance (29-40)	10	(27.0)	1	(5.9)	9	(27.3)	2	(15.4)
Acceptance (29-40)	7	(18.9)	1	(5.9)	6	(18.2)	2	(15.4)
Lack of acceptance (8-15)	20	(54.1)	15	(88.2)	18	(54.5)	9	(69.2)

**Table 3.** Average results of AIS questionnaire position

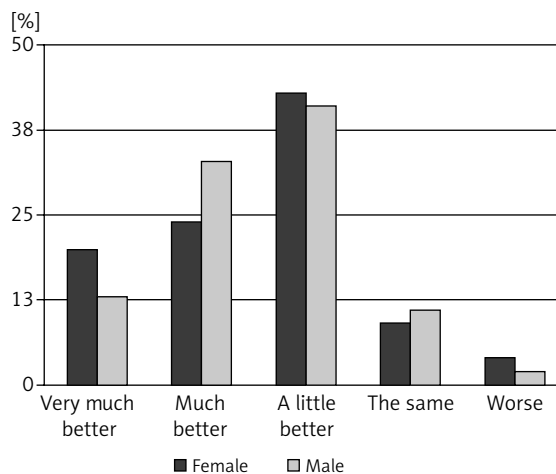
Question	Women		Men	
	up to 65 year X ±SD	over 65 year X ±SD	up to 65 year X ±SD	over 65 year X ±SD
1. I have problems with adjusting to the limitations imposed by the disease	3.4 ±1.24	2.4 ±1.27	3.2 ±1.15	3.2 ±1.14
2. Due to my health condition I'm not able to do what I like the most	3.5 ±1.26	2.4 ±1.32	3.0 ±1.32	3.0 ±1.08
3. The disease makes me feel unwanted	3.4 ±1.32	2.8 ±1.42	3.3 ±1.41	3.3 ±1.32
4. Health problems make me more dependent on others than I would like to be	3.3 ±1.31	2.4 ±1.18	3.3 ±1.19	3.2 ±1.21
5. The disease makes me a burden for my family and friends	3.5 ±1.35	2.8 ±1.39	3.6 ±1.43	3.0 ±1.41
6. Due to my health condition I do not feel a really valuable man	3.5 ±1.28	2.4 ±1.11	3.6 ±1.19	3.5 ±1.05
7. I will never be as self-sufficient to the extent to which I would like to be	3.3 ±1.37	2.0 ±1.06	3.3 ±1.25	3.2 ±1.24
8. I believe people that people who keep me company are often embarrassed because of my disease	3.6 ±1.34	2.9 ±1.45	3.7 ±1.38	3.4 ±1.39

**Table 4.** Co-existing diseases of the participants

Disease	Women (%)	Men (%)
Back pain	22	22
High blood pressure	24	30
Retinopathy	17	17
Nephropathy	7	28
Heart attack	4	–
Diabetic foot	17	11
Atrial fibrillation	–	2
Depression	2	–

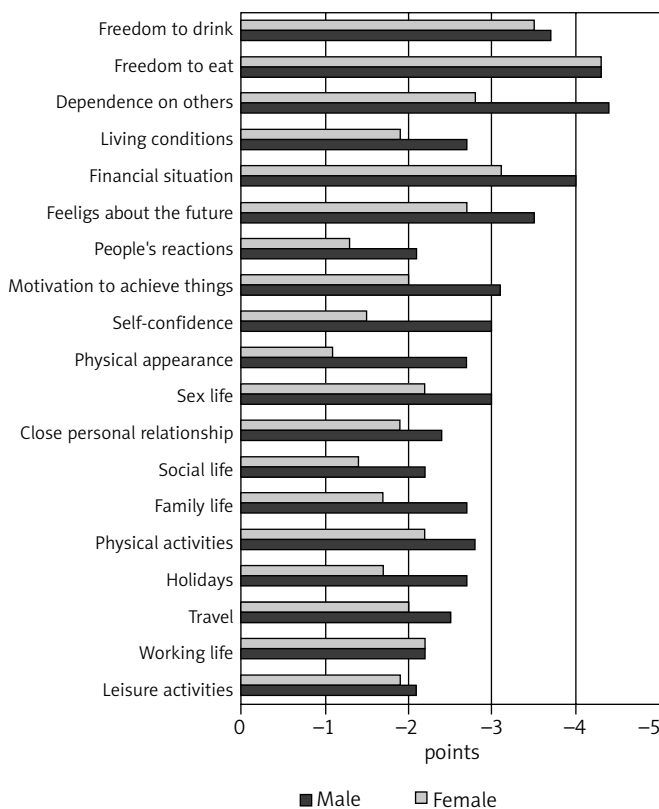
would be “a little better” (around 43% women and 41% men), or “much better” (24% female respondents and 33% male respondents). Surprisingly, 4% of women and 2% of men felt that their quality of life without diabetes would have been “worse”. There were no significant differences in the ADDQUL-19 between age groups.

Figure 2 shows a graphic comparison of the impact of diabetes on the domains of life. All patients declare an interdependency between the disease and “freedom to eat”, as well as “professional life”. For women, dia-



**Fig. 1.** Participants' quality of life in the absence of diabetes

betes affected their “leisure activities” and “other people’s reactions” on their health the least. For men the least affected domains of life were “physical appearance”, “other people’s reactions” and “leisure activities”. The impact of diabetes on all other domains was more severe in women than in men. Statistical analysis showed a significant difference ( $p < 0.05$ ) between men

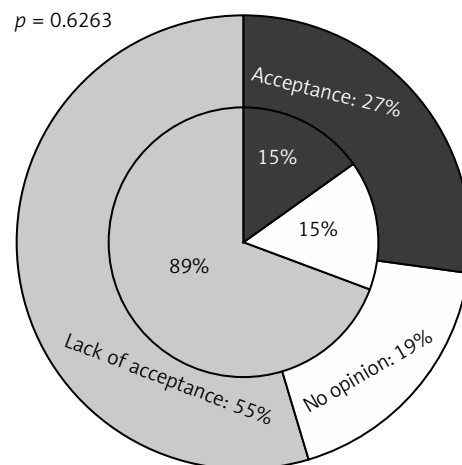


**Fig. 2.** Comparative analysis of the impact of diabetes on the individual domains of life according to the questionnaire AD-DQoL 19 (scale from -9 to 3 points)

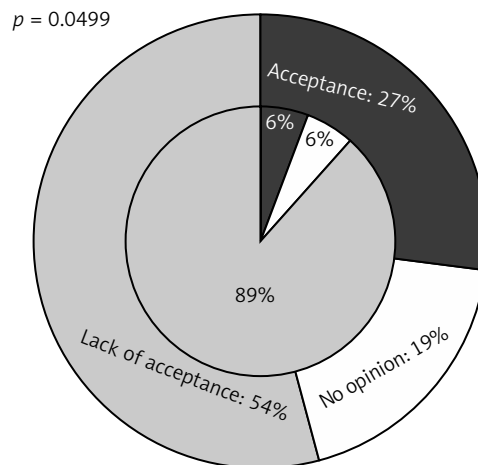
and women in the case of such domains of life as: “holidays”, “physical appearance”, “self-confidence”, “motivation to achieve things” and “dependence on others”.

Table 2 shows that the degree of acceptance of illness does not differentiate between men and women. Women have scored on average  $25.09 \pm 9.91$  points, while men scored  $26.95 \pm 8.50$  points. There was no significant relationship between women and men in terms of the degree of acceptance of illness. There were significant differences in the BMI values in the subgroups of women but not in the subgroups of men (respectively  $27.5 \pm 5.58$  and  $31.9 \pm 7.25$  kg/m<sup>2</sup> and  $27.9 \pm 4.09$  and  $27.8 \pm 4.53$ ).

Considering average values and reasons for not accepting the disease (Table 3) the statement “I believe people who keep me company are often embarrassed by my disease” was given the highest rating ( $3.6 \pm 1.34$ ) by women up to 65 years of age and ( $2.9 \pm 1.45$ ) by women aged over 65 years. In second place, they ranked the statement (“Due to my health condition I’m not able to do what I like the most” ( $3.5 \pm 1.26$ ); “The disease makes me a burden for my family and friends” ( $3.5 \pm 1.35$ ); “Due to my health condition I do not feel a really valuable person” ( $3.5 \pm 1.28$ ). The lowest rated statements for women were: “I will never be as self-sufficient as I would like to be” ( $3.3 \pm 1.31$ ) by women up to 65 years of age and “I will never be as self-sufficient to



Pie chart for men  
– external, up to 65 years old  
– internal, over 65 years old



Pie chart for women  
– external, up to 65 years old  
– internal, over 65 years old

**Fig. 3.** Comparison of the degree of acceptance of illness according to age

the extent to which I would like to be” ( $2.0 \pm 1.06$ ) for women over 65 years old.

For men up to 65 years of age, the statement “I believe people around me are often embarrassed by my disease” ( $3.7 \pm 1.38$ ), and for those over 65 years of age statement “Due to my health condition I do not feel a really valuable man” ( $3.5 \pm 1.05$ ) scored highest.

Statements that scored the lowest were: “Due to my health condition I’m not able to do what I like the most” by men under and over 65 years old with ( $3.0 \pm 1.32$ ) and ( $3.0 \pm 1.08$ ) points, respectively and “The disease makes me a burden for my family and friends” ( $3.0 \pm 1.32$ ) by men over 65 years old.

Figure 3 shows the patients’ degree of acceptance of diabetes according to age. More than half (54%) of women aged up to 65 years did not accept their disease. About one-third of them accepted it, while 19% of

women had no opinion on this, which suggests partial acceptance. 88% of women over the age of 65 years do not accept their disease while only 6% did not accept or fully accept it.

Statistical analysis of the women's answers (including age) showed significant differences at the level of  $p = 0.0499$  in the degree of acceptance of diabetes.

In a group of men up to 65 years of age, lack of acceptance of the disease was reported by 55% and 27% accepted it. Among the older men (over 65 years) 69% did not accept diabetes while 15,0% accepted it. There was no significant difference in the degree of acceptance of the disease by younger and older men ( $p = 0.6203$ ).

As Table 4 illustrates the most common ailments among respondents were high blood pressure, back pain, as well as nephropathy and retinopathy.

## Discussion

The assessment of the health-related quality of life includes the following aspects of the patient's life: physical state and mobility; social functioning, psychological and general well-being [11, 12]. Currently, the importance of a systematic assessment of the quality of life in chronic diseases is emphasised because the results of such an assessment determine the quality of therapeutic strategies undertaken and allow for their modification [13].

The ADDQoL 19 questionnaire [8] evaluated the information in undertaken studies on how diabetes affects health-related quality of life. Results indicate that the impact of diabetes on the quality of life depends on the patient's age, gender, and BMI. Older patients felt the effects of disease more than younger ones (Fig. 3), and women more severely than men (Fig. 2). In the case of women, also a significant dependence between the BMI and quality of life was seen ( $p < 0,05$ ; Table 2).

Lack of extreme assessments of the disease's impact (as strongly "positive" or strongly "negative" on quality of life (Fig. 2, Table 2) on the one hand, suggests that patients, despite the burden of diabetes, somehow "learned to live with it", and on the other hand, suggests that patients without higher education have lower expectations. The vast majority of participants evaluated their quality of life as "neither good nor bad" (Table 2), similarly to previously published research results presented by [14]. In their study, 60% of women rated their quality of life lower than men, and male participants with a lower education gave a higher assessment. The authors interpret the study's results as quality of life expectations growing with education. Similar results were also presented by other authors [11, 15].

Interesting results were obtained by asking respondents the question: what would be their quality of life had they not had diabetes? (Fig. 1). More than 40% of

male and female respondents answered that it would have been a little better, and for about 10% it would have been the same. This data makes the acceptance of the disease partly credible as well as its effects on patients of both genders.

Analysing the impact of diabetes on the participants' individual domains of life (Fig. 2), it should be stressed that it mostly affects their diet and appetite, independence, financial situation, feelings about the future, sex life and freedom to drink. The emphasis placed by diabetics on the disease's impact on the composition and selection of food products in daily rations, according to participants, stems from restrictions on the consumption of sweets, fats, alcohol and on meal scheduling [16]. These restrictions can negatively influence mood and affect quality of life in the long term. Another cause of the negative impact of the disease on quality of life is caloric restrictions. The priority in the treatment of diabetes is to limit the amount of food eaten and/or to reduce its calorific value. As shown in this study and in several studies by other authors, 30% of people with diabetes are obese [13]. For patients, changing their lifestyle is more difficult than implementing medical recommendations [17].

Women suffer from the negative impacts of diabetes more than men, specifically in such domains of life as physical appearance, motivation to achieve things, self-confidence, independence and holiday habits (Fig. 2). Also in the study of Fallon and Rozin [18] women focus on their physical appearance more than men do. These findings are confirmed by other authors [19].

A significant difference between men and women was also found regarding self-esteem. Almost twice as many women responded that diabetes negatively affects this domain of their life as compared to men. Similar results were presented by Rassart *et al.* [20] by measuring the level of confidence in people with type 1 diabetes. It follows that women had definitely lower self-esteem than their peers in the control group. There are a number of studies showing that lower self-esteem is a result of the presence of an incurable disease, education, and age [21, 22]. The lower assessment of a diabetic's quality of life is also the result of the presence of long-term complications [11, 23] or other ailments, as shown in Table 4.

The AIS questionnaire showed (Table 2) that over 50% of women aged up to 65 years and about 90% over 65 years, and over 50% of younger men and 70% of older men do not accept their disease. However, younger patients had a much greater degree of diabetes acceptance, regardless of gender, compared to older patients. This may be related to the lowering of the overall functional capacity in everyday life with age. Similar results were provided by Kurowska and Lach [24]. Niedzielski *et al.* [25] measured the levels of acceptance in other chronic diseases (e.g. in bronchial asthma, coronary

heart disease and among patients treated with dialysis) with high scores in all cases. Significant correlation between body mass index and mortality was noted in their study Kvamme *et al.* [26] and Dolan *et al.* [27]. They have also demonstrated that women more than men do not accept their disease. Therefore it may be concluded that, despite the fact that the patient is forced to live with diabetes, the disease is mostly not accepted due to the threat of serious complications (Tables 3, 4 and Fig. 3).

When examining specific areas of acceptance of illness (Table 3), both women and men mostly stated that they do not agree that people around them can be troubled by their disease. The lowest rated answer for women was a sense of lack of self-sufficiency. Men emphasised a sense of helplessness in doing what they “like to do”. Similar results were presented by Kurowska and Lach [24]. According to the authors, the positive feelings patients experienced were based on “not being a burden to loved ones” and negative feelings were of insufficiency and inability to “do what they most like to do”. Similar results were also shown by Kurowska and Kasprzyk [28] in patients on dialysis, which permits acceptance of the hypothesis that support from close relatives plays a key role in the mental well-being of the chronically ill.

As presented in this study there is no relationship between the degree of acceptance of illness and gender (Table 2), although according to Niedzielski *et al.* [25] in reviewing degrees of acceptance in selected chronic diseases, there is a relationship between the level of acceptance of illness among women and men, to the detriment of women. The dependence between the degree of acceptance of a chronic illness and age was also analysed by other authors [29, 30]. According to them, this interdependence is determined by the fact that, with age, other ailments escalate, such as degenerative changes in joints, neurological disorders, and motor skill deterioration, even with financial limitations.

According to Juczyński [10] non-acceptance of illness affects self-esteem and deepens a feeling of dependence on others. This is confirmed by this study's results, especially among people over 60 years of age (Table 3, Fig. 3). Similarly, King *et al.* [31] indicate that patients who treat their illness as “a challenge worth their efforts” have a greater chance of accepting it. Only the acceptance of limitations caused by the illness allows the patient to develop motivation, goals and overcoming the difficulties induced by diabetes mellitus [32].

## Conclusions

1. Type 2 diabetes negatively affects patients' quality of life, its impact is bigger on women.
2. The lack of freedom in nutrition is the domain of life mostly affected by diabetes for both genders.
3. The degree of illness acceptance depends on age.

## Disclosure

Authors report no conflict of interest.

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