

Illness perception and perceived benefits of illness among persons with type 1 diabetes

BACKGROUND

Illness perception is assigned an increasing role in the control of chronic disease. This study examines illness perception and perceived benefits related to illness in persons with type 1 diabetes mellitus. We used quantitative and qualitative methods for a more in-depth analysis.

PARTICIPANTS AND PROCEDURE

The participants ($N = 110$; mean age: 31.52 years; 80.9% women) completed online questionnaires: the Brief Illness Perception Questionnaire (B-IPQ), the perceived benefits subscale of the Illness Cognition Questionnaire (ICQ) and the Hospital Anxiety and Depression Scale (HADS). Interpretative phenomenological analysis (IPA) was used to analyze patients' responses to an open-ended question regarding perceived benefits.

RESULTS

Perceived benefits score was positively correlated with personal ($p = .20$) and treatment control: life-style ($p = .25$) and coherence ($p = .22$). Negative correlations were noted between B-IPQ total score ($p = -.30$), concern ($p = -.30$), depression ($p = -.35$), anxiety ($p = -.32$) and irritabil-

ity ($p = -.19$). 52.7% of participants reported at least one benefit of having type 1 diabetes. Patients who reported at least one benefit had statistically significantly higher scores in the perceived benefits subscale ($p < .001$), personal control ($p = .005$) and treatment control ($p = .030$) and lower scores in consequences ($p = .023$), identity ($p = .045$), concern ($p < .001$), emotional response ($p < .001$), and illness perception total score ($p < .001$) than those who did not report any benefit. IPA revealed four main themes: personal benefits, health-related benefits, social contacts and economic benefits.

CONCLUSIONS

The study revealed that in patients with type 1 diabetes perceived disease benefits are closely related to more positive illness perception and lower levels of depression, anxiety and irritability. The findings suggest that addressing potential benefits related to illness may influence the emotional state.

KEY WORDS

illness cognitions; benefit finding; qualitative analysis; anxiety; depression

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BACKGROUND

Nowadays, an increasingly important role of illness perception in managing chronic illnesses is emphasized. Perception of illness receives growing attention from researchers and clinicians. One of the fundamental theories of illness perception is the common sense model of self-regulation (CSM) (Hagger et al., 2017; Leventhal et al., 2016). According to the theory, when an individual identifies a symptom or deviation from optimal functioning, he/she creates an individual conception of an illness. The model identifies cognitive and emotional representations of the illness threat. Cognitive representation of illness comprises five main dimensions: identity, timeline, consequences, causes, and control/cure. The pertinence and clinical usefulness of the CSM model have been proved in many studies (Hagger & Orbel, 2003; Hagger et al., 2017).

Building on the existing models of illness perception, Evers et al. (2001) proposed an extended conception of illness cognition focused on three main aspects: helplessness, acceptance and perceived benefits. According to these authors, the existing models did not include cognitive dimensions emphasizing the beneficial repercussions of a disease. The investigators also stated that mental representations of illness threat may automatically make patients focus on negative illness aspects which, as a consequence, may lead to diminished treatment efficacy. Thus the proposed theoretical concept includes both unfavorable and beneficial aspects of adaptation to chronic illness. Exploring benefits finding related to chronic disease seems to complement the threat perception concept presented in the CSM.

Research on diabetes mellitus so far has indicated the importance of illness perception as well as other psychological constructs for metabolic control measured by glycated hemoglobin level (HbA_{1c}) (Wisting et al., 2021). More positive illness perception of diabetes is associated with more effective glycemic control (Mc Sharry et al., 2011), which in turn decreases the probability of future diabetes-related complications. In conjunction with a task-oriented coping strategy, more positive illness perception is a predictor of more effective adjustment to type 1 diabetes (Bazzazian & Besharat, 2012). However, research involving patients diagnosed with type 1 diabetes has been most often focused on children and adolescents (Martinez et al., 2018). A literature review proved the vital role of various psychological factors related to management of diabetes among children and adolescents and at the same time the scarcity of studies focused on adult patients with type 1 diabetes. Also, finding benefits in this specific patient population seems insufficiently investigated. Moreover, no study exploring perceived benefits measured with the Illness Cognition Questionnaire subscale has been found in

the available literature. Evers et al. (2001), referring to the specificity of a particular chronic disease, recommended exploring illness cognition dimensions among diabetic patients. Such studies would add significant knowledge to our understanding of this specific group of patients and contribute to further verification of the proposed model.

Qualitative analysis allows more in-depth exploration and understanding of an individual perspective (Biggerstaf, 2012; Pietkiewicz & Smith, 2014). Although used by pioneers of psychology, there has been continuing debate on the scientific significance of qualitative methods (Wertz, 2014). Recently, qualitative studies are gaining growing appreciation and an integrative approach using both quantitative and qualitative methods is considered valuable, especially in the field of health psychology (Biggerstaf, 2012; Sęk, 2010).

The aim of the present study was to assess perceived benefits and illness perception among patients diagnosed with type 1 diabetes. We also sought to examine possible associates of benefit finding. In addition, interpretative phenomenological analysis was used to analyze patients' responses to an open-ended question about perceived benefits of having type 1 diabetes.

PARTICIPANTS AND PROCEDURE

STUDY SAMPLE

This mixed-methods study involved 110 patients with type 1 diabetes aged 18-65 years (80.9% women; mean age 31.52 years, $SD = 9.57$). Quantitative and qualitative analyses were performed. The characteristics of the study sample are presented in Table 1. The participants completed online questionnaires. The study was approved by Independent Bioethics Committee for Research (approval numbers: NKBBN/536/2015 and NKBBN/536-95/2020). All the patients gave their consent for study participation.

MEASURES

The Brief Illness Perception Questionnaire (B-IPQ; Broadbent et al., 2006) assesses illness perception as defined by the common sense model (CSM). The questionnaire comprises 8 items reflecting illness perception dimensions: consequences, timeline, personal control, treatment control, identity, coherence, concern, and emotional response. Additional items regarding methods of treatment were included – treatment control: medication, treatment control: life-style. The possible range of scores is 0 to 10 points. The higher the total score of B-IPQ the more threatening is illness perception. Reliability of the Polish version of the

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questionnaire has been proven in a group of patients suffering from various chronic diseases, including autoimmune diseases (Nowicka-Sauer et al., 2016).

The Illness Cognition Questionnaire (ICQ; Lauwerier et al., 2010) includes 3 subscales (18 items): helplessness, acceptance and perceived benefits. The possible range of scores is 6 to 24 points. Patients are asked to refer to every item on a 4-point Likert scale, depending on the extent he/she agrees with a particular statement (1 – *not at all*, 2 – *somewhat*, 3 – *to a large extent*, 4 – *completely*). In the present study we used the perceived benefits (PB) subscale. The range of scores on the PB subscale is 6 to 24 points, where a higher score reflects a higher level of perceived benefits (Evers et al., 2001). Cronbach's α of the PB subscale was .87, reflecting its good internal consistency.

The Hospital Anxiety and Depression Scale – Modified (HADS-M; Zigmond & Snaith, 1983) contains 14 items assessing depressive and anxiety symptoms

(7 items for each). Answers are scored with a 4-point Likert scale (0-3 points). A score between 0 and 7 indicates a normal level of depression/anxiety, while 8 to 10 points present borderline score and a score above 11 points indicates a pathological level of the assessed symptoms. HADS-M contains 2 additional items reflecting irritability, with the possible range of scores 0 to 6 points (Majkowicz et al., 2000).

The authors' questionnaire contained the following "yes/no" question: "Can you see any positive aspects of the fact that you have type 1 diabetes mellitus?" Patients who answered the above question positively were asked to enumerate perceived benefits by answering an open-ended question: "Please list the benefits of having type 1 diabetes." Participants' responses were analyzed using the interpretative phenomenological analysis (IPA; Pietkiewicz and Smith, 2014). A tailor-made questionnaire was used to obtain socio-demographic and clinical data.

Table 1

Socio-demographic and clinical characteristics of study participants (N = 110)

Age, years: <i>M</i> (<i>SD</i>); median (min-max)	31.52 (9.57); 29.5 (18-65)	Place of residence	
Gender		Village	24 (21.80)
Female	89 (80.90)	City up to 50,000 inhabitants	15 (13.60)
Male	21 (19.10)	City up to 100,000 inhabitants	14 (12.70)
Educational level		City up to 250,000 inhabitants	12 (10.90)
Primary	2 (1.80)	City over 250,000 inhabitants	45 (40.90)
Vocational	4 (3.60)	Time from diagnosis of diabetes, years: <i>M</i> (<i>SD</i>); median (min-max)	16.05 (9.38); 16.5 (1-50)
Technical secondary school	3 (2.70)	BMI: <i>M</i> (<i>SD</i>); median (min-max)	24.70 (4.41); 23.63 (17.36-42.42)
High school	34 (30.90)	Underweight	5 (4.50)
University	67 (60.90)	Optimal weight	57 (51.80)
Employment status		Overweight	35 (31.80)
Student	26 (23.60)	Obesity	13 (11.80)
Employed	71 (64.50)	Comorbidities	
Unemployed	8 (7.30)	Yes	62 (56.40)
Retired or disability pension	5 (4.50)	No	48 (43.60)
Marital status		History of depression	
Married	42 (38.20)	Yes	25 (22.70)
Divorced	6 (5.50)	No	85 (77.30)
Widowed	1 (0.90)	History of anxiety disorder	
Single	61 (55.50)	Yes	16 (14.50)
		No	94 (85.50)

Note. Data presented as number and percentage, unless otherwise specified. BMI – body mass index.

DATA ANALYSIS

Descriptive statistics (mean, standard deviation, median, maximal and minimal value, number and percentage) were used to present results. The Shapiro-Wilk test was used to verify whether the quantitative variables had a normal distribution. Reliability of the perceived benefits subscale was verified using Cronbach's α test. Due to the lack of normality of the variables, Spearman's ρ correlation coefficient was used. The Mann-Whitney U -test was used to assess the differences between the subgroups. All calculations were performed using the SPSS package at the significance level $\alpha = .05$.

RESULTS

As shown in Table 2, median score for B-IPQ total score was 45.5 points. The highest scores were in timeline, treatment control: medication, and treat-

Table 2

Illness perception dimensions, perceived benefits, depression, anxiety, and irritability scores in the studied sample (N = 110)

Variable	M (SD)	Median (min-max)
Consequences	7.07 (2.36)	7.00 (2-10)
Timeline	9.81 (0.70)	10.00 (6-10)
Personal control	6.92 (1.97)	7.00 (1-10)
Treatment control	7.52 (2.40)	8.00 (0-10)
Treatment control: medication	9.01 (1.38)	10.00 (5-10)
Treatment control: life-style	8.89 (1.50)	10.00 (4-10)
Identity	6.54 (2.55)	7.00 (0-10)
Concern	6.86 (2.64)	7.00 (0-10)
Coherence	7.62 (2.08)	8.00 (0-10)
Emotional response	7.08 (2.86)	8.00 (0-10)
Illness perception total score	45.31 (10.36)	45.50 (24-67)
Perceived benefits (ICQ)	13.60 (4.26)	13.00 (6-24)
Depression	5.23 (3.95)	5.00 (0-18)
Anxiety	7.81 (4.31)	8.00 (1-20)
Irritability – internal	2.00 (0.89)	2.00 (0-3)
Irritability – external	1.56 (0.95)	2.00 (0-3)
Irritability total score	3.56 (1.59)	4.00 (0-6)

Note. ICQ – Illness Cognition Questionnaire.

ment control: life-style (median = 10 points for all variables). Median score for perceived benefits was 13 points. HADS anxiety median score was 8 points and it was higher than the depression median score (5 points).

Analysis of correlations revealed that the perceived benefit score was significantly positively correlated with personal control ($\rho = .20$), treatment control: life-style ($\rho = .25$), and coherence ($\rho = .22$). Perceived benefits score was significantly negatively correlated with B-IPQ total score ($\rho = -.30$), concern ($\rho = -.30$), depression ($\rho = -.35$), anxiety ($\rho = -.32$), and irritability total score ($\rho = -.19$). No other significant correlations were noted (Table 3).

On the basis of a "yes/no" response to the question "Can you see any positive aspects of having type 1 diabetes?", participants were assigned to one of two groups: a group of participants who did not report any benefits – the "No benefits" group including 58 participants (52.7%); and a group of participants

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Table 3

Correlation coefficients between perceived benefits subscale score and other quantitative variables

Variable	Perceived benefits (ICQ)	
	ρ	p
Consequences	-.14	.139
Timeline	-.04	.657
Personal control	.20*	.036
Treatment control	.07	.493
Treatment control: medication	.14	.154
Treatment control: life-style	.25**	.008
Identity	-.05	.604
Concern	-.30**	.001
Coherence	.22*	.019
Emotional response	-.19	.052
Illness perception total score	-.30**	.002
Depression	-.35**	< .010
Anxiety	-.32**	.001
Irritability – internal	-.17	.085
Irritability – external	-.18	.057
Irritability total score	-.19*	.042
Age	-.15	.120
BMI	-.07	.451
Time from diagnosis of diabetes	.08	.431

Note. BMI – body mass index; ρ – Spearman's rank correlation coefficient; *significant correlation at $p < .05$; **significant correlation at $p < .01$.

reporting at least one benefit – the “Reported benefits” group including 52 participants (47.3%). The two groups were compared in terms of the ICQ perceived benefits, B-IPQ and HADS scores (Table 4).

As shown in Table 4, the “No benefits” group had statistically significantly lower scores than the “Reported benefits” group in the perceived benefits subscale ($p < .001$), personal control ($p = .005$) and treatment control ($p = .030$). Patients who did not report any benefits had statistically significantly higher scores in consequences ($p = .023$), identity ($p = .045$), concern ($p < .001$), emotional response ($p < .001$), and illness perception total score ($p < .001$) than the “Reported benefits” group. No statistically significant differences were found between the two subgroups in terms of socio-demographic variables (Table 5).

RESULTS OF QUALITATIVE ANALYSIS

Fifty-two participants gave their responses to an open-ended question regarding perceived benefits. Patients’ responses were analyzed using IPA, which

revealed four main themes and several subthemes presented in Table 6.

The most common benefits related to having diabetes were health-related benefits reported by 28 participants (53.8%), while 25 persons (48.1%) reported benefits classified as personal benefits. Social benefits were mentioned by 12 participants (23.1%), and economic benefits were reported by 2 persons (3.8%).

HEALTH-RELATED BENEFITS

This was a strong theme containing responses reflecting an awareness of healthy life-style as a vital benefit. Patients mentioned several aspects such as changing life-style in terms of healthy diet and physical activity, systematic monitoring of health state, symptom control, undertaking medical examination, and being under constant medical care. The patients’ responses were also related to growth in medical knowledge, especially regarding diabetes mellitus. The following statements are the best examples of patients’ responses included in this theme:

Table 4

Comparison of the two studied groups in terms of perceived benefits, illness perception, depression, anxiety, and irritability

	No benefits ($n = 58$)		Reported benefits ($n = 52$)		Mann-Whitney U -test	
	M (SD)	Median (min-max)	M (SD)	Median (min-max)	Z	p
Perceived benefits (ICQ)	11.81 (3.54)	11.00 (6-21)	15.60 (4.14)	15.00 (9-24)	-4.57	< .001
Consequences	7.45 (2.47)	8.00 (2-10)	6.65 (2.19)	7.00 (2-10)	-2.27	.023
Timeline	9.88 (0.46)	10.00 (8-10)	9.73 (0.89)	10.00 (6-10)	-0.86	.391
Personal control	6.45 (2.09)	7.00 (1-10)	7.44 (1.70)	8.00 (2-10)	-2.82	.005
Treatment control	7.10 (2.45)	8.00 (0-10)	7.98 (2.29)	9.00 (1-10)	-2.17	.030
Treatment control: medication	9.02 (1.38)	10.00 (5-10)	9.00 (1.40)	10.00 (5-10)	-0.003	.997
Treatment control: life-style	8.71 (1.51)	9.00 (5-10)	9.10 (1.49)	10.00 (4-10)	-1.69	.091
Identity	6.93 (2.68)	8.00 (0-10)	6.10 (2.35)	6.50 (1-10)	-2.01	.045
Concern	7.62 (2.47)	8.00 (1-10)	6.02 (2.58)	6.50 (0-10)	-3.51	< .001
Coherence	7.28 (2.45)	8.00 (0-10)	8.00 (1.51)	8.00 (4-10)	-1.25	.210
Emotional response	7.97 (2.65)	9.00 (0-10)	6.10 (2.78)	6.50 (0-10)	-3.96	< .001
Illness perception total score	49.02 (10.34)	51.00 (24-67)	41.17 (8.78)	42.00 (24-60)	-4.15	< .001
Depression	6.17 (4.33)	6.00 (1-18)	4.17 (3.19)	4.00 (0-12)	-2.42	.016
Anxiety	8.98 (4.69)	9.00 (2-20)	6.50 (3.44)	6.00 (1-16)	-2.77	.006
Irritability	3.97 (1.57)	4.00 (0-6)	3.12 (1.50)	3.00 (0-6)	-2.90	.004

Note. ICQ – Illness Cognition Questionnaire.

Paying more attention to things within my body, some symptoms may be related to diabetes but don't have to. I examine them and thanks to that a couple of times I have avoided a serious condition (Patient 17).

I pay attention to what I eat (healthy products, full of vitamins and minerals, less processed food), I monitor my health regularly, I exercise more (Patient 51).

The understanding of a healthy diet and physical exercise (Patient 45).

I examine myself regularly so I will be aware of any abnormalities sooner than an average Pole (Patient 7).

Rational eating taking into account glycemic index and carbohydrate counting, long walks and different kinds of exercise (Patient 52).

Increased health control: examination, healthy diet, activity (Patient 12).

Regular blood test and eye examination, healthy eating (Patient 28).

I take care of myself, I monitor my results, I eat better food (Patient 49).

Definitely better knowledge about body functioning, greater awareness of the importance of a healthy lifestyle, regular health check-ups for certain diseases, potential health complications (Patient 22).

PERSONAL BENEFITS

Within this main theme several subthemes were extracted. The participants often expressed reflection on significant changes in priorities, and attitude to the world, both the external and inner world.

I enjoy little things and appreciate every joy (Patient 34).

I don't care about trivial problems such as dressing up for school or work (Patient 20).

I got to know myself better (Patient 27).

Better self-control, orderliness, ability to plan (Patient 32).

This theme emphasizes positive growth, since changes were directly related to the fact of diabetes diagnosis. Also important aspects that emerged were personal strength, self-efficacy and features helpful in coping with the disease.

I am tough psychologically. I am not afraid of anything. I am systematic and consistent (Patient 41).

Greater motivation to do things, ability to cope with obstacles (Patient 1).

Self-discipline, responsibility for myself (Patient 25).

Table 5

Comparison of the two studied groups in terms of sociodemographic data

Variable	No benefits n (%)	Reported benefits n (%)	χ^2 test
Sex			
Women	48 (53.90)	41 (46.10)	$\chi^2 = 0.27$ $p = .602$
Men	10 (47.60)	11 (52.40)	
Educational level			
Primary	1 (50.00)	1 (50.00)	$\chi^2 = 1.08$ $p = .897$
Vocational	2 (50.00)	2 (50.00)	
Technical secondary school	1 (33.30)	2 (66.70)	
High school	20 (58.80)	14 (41.20)	
University	34 (50.70)	33 (49.30)	
Place of residence			
Village	18 (75.00)	6 (25.00)	$\chi^2 = 7.85$ $p = .097$
City up to 50,000 inhabitants	5 (33.30)	10 (66.70)	
City up to 100,000 inhabitants	8 (57.10)	6 (42.90)	
City up to 250,000 inhabitants	6 (50.00)	6 (50.00)	
City over 250,000 inhabitants	21 (46.70)	24 (53.30)	
Marital status			
Married	30 (49.20)	31 (50.80)	$\chi^2 = 2.22$ $p = .528$
Divorced	24 (57.10)	18 (42.90)	
Widowed	0 (0.00)	1 (100.00)	
Single	4 (66.70)	2 (33.30)	
Employment status			
Student	9 (34.60)	17 (65.40)	$\chi^2 = 5.23$ $p = .156$
Employed	42 (59.20)	29 (40.80)	
Unemployed	5 (62.50)	3 (37.50)	
Retired or disability pension	2 (40.00)	3 (60.00)	
Economic status			
Good	17 (44.70)	21 (55.30)	$\chi^2 = 1.74$ $p = .420$
Medium	37 (56.10)	29 (43.90)	
Bad	4 (66.70)	2 (33.30)	
Comorbidities			
No	25 (52.10)	23 (47.90)	$\chi^2 = 0.01$ $p = .905$
Yes	33 (53.20)	29 (46.80)	

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Table 6

Main themes and subthemes

Health-related benefits	Personal benefits	Social contacts	Economic benefits
Knowledge: medical	Positive growth	Expanding social	Financial benefits:
Increased awareness	Personal growth	contacts	discounts, scholarships
of healthy life-style	Knowledge: general	Becoming friends with	
importance	Being at the center	people with diabetes	
Health state monitoring	of attention		

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One patient also indicated similar personality traits as benefits, including her growth in empathy:

Greater responsibility, ability to plan and predict, coping with difficult situations, enjoying the little things, more empathy towards others (Patient 6).

The subtheme “personal growth” also involves benefits related to gaining general medical knowledge which in the patients’ opinions is valuable in terms of healthy behaviors.

I have the knowledge on how my body works (Patient 24).

I have knowledge that others don’t (Patient 18).

Definitely better knowledge about body functioning, greater awareness of the importance of a healthy lifestyle, regular health check-ups for certain diseases (Patient 22).

This subtheme also involves concepts relating to the usefulness of knowledge in other areas of life, e.g. professional career.

Vast knowledge about a diabetic diet. I use my experience at work (Patient 44).

I got interested in medical faculties which influenced my choice of studies (Patient 38).

The subtheme exploring personal growth seems to be partially linked to the subtheme related to medical knowledge, which in consequence directly influences health-improving behaviors, changing life-style and the possibility of using this knowledge to spread awareness of diabetes and help other patients with the disease as well as the diabetic community.

I know the symptoms of hypoglycemia and I can help a person in need (Patient 40).

I educate other people how to avoid diabetes (Patient 30).

The impact of raising people’s awareness of reactions towards negative consequences of diabetes in other diabetics (Patient 22).

It is noteworthy that the subtheme related to the growth of knowledge was classified into two main themes, but in different contexts: first, as personal growth and second, as gaining knowledge which contributed to life-style changing and intentional caring for health. Both of them seem of great importance.

Some participants’ responses may suggest a sense of gaining attention from other people, being important for others or a sense of uniqueness.

I am at the center of attention (Patient 9).

People take interest in me (Patient 47).

SOCIAL CONTACTS

For some of our participants making friends with other people suffering from diabetes was the most important benefit. This theme further emphasizes the importance of expanding social contacts, which is undoubtedly valuable for our patients. This theme seems to be related to a sense of being a part of the diabetes community, which in turn may be a source of support but also an opportunity to give support to others.

The possibility to meet new people and make friends (Patient 27).

I made many friends among diabetics (Patient 50).

I met people fighting the same disease (Patient 4).

I met great people (Patient 37).

It cannot be excluded that expanding social contacts and gaining new friends both may constitute a pathway to positive growth. Future work may shed light on this interesting aspect.

Some patients reported several benefits, indicating more extended benefit finding:

Definitely better knowledge about body functioning, a better understanding of the importance of a healthy lifestyle, constant health monitoring of a certain group of potential diseases/complications, the impact of raising people’s awareness of reactions towards negative consequences of diabetes in other diabetics (Patient 22).

I have created ‘me the diabetic’. I have many international friends, I can go on diabetes trips, I can help other people (Patient 19).

ECONOMIC BENEFITS

Benefits related to financial aspects were noted by a small group of participants. The statements were related to gaining funding or discounts for diabetics.

Financial aspects (Patient 8).

I get a scholarship and discounts (Patient 9).

I can go on tours related to diabetes (Patient 27).

DISCUSSION

In line with the purpose of the study, which was to explore illness perception with a particular emphasis on perceived benefits related to type 1 diabetes and its potential correlates, both quantitative and qualitative methods were used. The quantitative approach allowed us to identify general tendencies and associations between perceived benefits and other aspects of patients' functioning. The questionnaires used in our study are widely used methods with proven reliability in studies involving patients with chronic diseases, including endocrine, nutritional and metabolic diseases (Broadbent et al., 2015; Nowicka-Sauer et al., 2016).

Qualitative analysis enriched the research by allowing for a more in-depth exploration of patients' experiences and a better understanding of their perspective, including opinions, feelings and emotions (Biggerstaff, 2012; Pietkiewicz & Smith, 2014).

As expected, the present study revealed that a more negative illness perception was associated with lower benefit finding. A stronger belief of benefit finding was related to higher personal control and a stronger opinion that life-style is important in managing diabetes. Patients with higher benefit finding had less intense depressive, anxiety and irritability symptoms. Consistently, patients who reported any benefits related to diabetes had higher results on the perceived benefits subscale and a more positive perception of the disease. They also had a stronger belief about their control over the disease and treatment effectiveness. A lack of benefit finding was related to more severe consequences and symptoms of diabetes, and more intense negative emotions related to the disease. Unfortunately, only half of the studied group reported any benefit related to diabetes. It is optimistic that our patients generally held strong beliefs about the medication and life-style effectiveness in diabetes treatment.

There is a growing literature on the CSM model of illness perception (Hagger & Orbel, 2003). However, studies examining illness perception among patients with type 1 diabetes have been focused mainly on children and adolescents (Fonte et al., 2019; Martinez et al., 2018; Terrasson et al., 2018). This has resulted in an insufficient understanding of the perspective of adult patients. Several studies have reported an association between positive illness perception and more effective glycemic control (Bazzazian & Besharat, 2012; Mc Sharry et al., 2011; Wisting et al., 2021). Experiencing more symptoms and negative consequences of the disease, perceived unpredictability and a cyclic course of diabetes are related to worse glycemic control, while believing that one has personal control over the disease is associated with better outcomes (Mc Sharry et al., 2011). Research has also indicated

that interventions aimed at making illness perception more positive may improve glycemic control (Mc Sharry et al., 2011). Wisting et al. (2021) observed that both among women and men HbA_{1c} was associated with personal control; however, in women, it was also related to coping based on seeking emotional support.

Illness perception among adult and adolescent patients with diabetes was less threatening in studies by Bazzazian and Besharat (2012) and Wisting et al. (2016) compared to the current results. This difference may be related in part to differences in the study samples. For example, in the study by Bazzazian and Besharat (2012) patients were participating in an educational program, which may have influenced their perception of the disease. It is also worth noting that women were overrepresented in the current study. As was observed in one study involving adolescents and young adults, female sex is related to a more negative illness perception (Wisting et al., 2016).

Looking at the particular dimensions of illness perception among our patients and those with chronic obstructive pulmonary disease (COPD) (Tiemensma et al., 2016), asthma (Broadbent et al., 2006), or type 2 diabetes (Broadbent et al., 2006), the most significant differences are related to consequences and emotional response. In the present study, patients had experienced a more severe impact of the disease on their lives and a higher emotional burden related to it. These discrepancies are also observed when compared to patients suffering from systemic lupus erythematosus (SLE) (Nowicka-Sauer et al., 2017); however, the difference seems less significant. Given the above-mentioned diseases, illness perception among our patients with type 1 diabetes seems to be the most compatible with patients with type 2 diabetes (Broadbent et al., 2006) and SLE (Nowicka-Sauer et al., 2017). However, the results indicate that type 1 diabetes sufferers perceive their symptoms as more burdensome than patients with type 2 diabetes (Broadbent et al., 2006). In the case of patients with SLE, differences emerged in coherence; e.g. our participants report a better understanding of their disease than SLE sufferers (Nowicka-Sauer et al., 2017). In terms of personal control, comparable levels of perceived ability to control the disease were observed.

Research on illness perception and its associations with benefit finding is scarce. Benefit finding is defined as "perceiving positive life changes resulting from adversity" (Helgeson et al., 2006; Rassart et al., 2017). The authors of a meta-analysis claim that the majority of studies on benefit finding concern patients with cancer, and they emphasized the need for further research on other chronic diseases (Helgeson et al., 2006). The idea of focusing on perceived benefits in the present study stemmed from the lack of studies taking a valuable approach, as presented by Schur et al. (1999). Instead of solely identifying the experienced difficulties, the authors aimed to more

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deeply understand patients who are dealing well with a disease. An additional literature research revealed that no previous studies have used the ICQ in adult patients with diabetes. This review also showed that researchers often refrain from assessing perceived benefits (Casier et al., 2013; Evers et al., 2002; Joosten-Weyn Banningh et al., 2008; Poppe et al., 2013; Samuel et al., 2006). Hence, it is difficult to refer to other studies involving adult patients with diabetes.

The mean level of perceived benefits in our group of patients with diabetes seems to be similar to that in patients with rheumatic diseases (Bode et al., 2010; Vervloesem et al., 2012), Crohn's disease (Mosli et al., 2021), and amyotrophic lateral sclerosis (Kruitwagen-van Reenen et al., 2020). A slightly lower level of benefit finding was noted in our patients compared to chronic pain sufferers (Lauwerier et al., 2010), women with breast cancer (Han et al., 2018), patients with a stoma following rectal cancer treatment (Bossema et al., 2011), patients before and after renal transplantation (de Vries et al., 2019) and those with HIV (Earnshaw et al., 2013). Benefit finding was lower in patients with chronic fatigue compared to our patient group (Lauwerier et al., 2010). Nevertheless, benefit finding may differ according to the specific population (Evers et al., 2001; Helgeson et al., 2006). Thus, an exploration of possible associates and factors influencing perceived benefits seems vital.

In the current study, important associations with benefit finding were noted. Patients who reported benefit finding had a stronger belief of having personal control over the disease and a stronger belief about treatment effectiveness. These results are in accord with the correlation results and previous results from Rassart et al. (2017). In the present study participants reporting benefits perceived their disease as having fewer negative consequences, and experienced less severe symptoms and less intensive negative emotions related to the disease. In general, patients reporting benefits had more positive illness perception. Our findings are in agreement with a longitudinal study involving adolescents with type 1 diabetes. In this latter study, benefit finding was associated with stronger perceived personal control, treatment effectiveness, lower disease concern, and better coherence (Rassart et al., 2017).

We also observed that benefit finding was related to less intense depressive symptoms. A similar association was noted in a study of young adults with chronic diseases (Verhoof et al., 2014). However, in our study, this association was stronger. De Vries et al. (2019) observed similar tendencies among patients before and after renal transplantation, with higher optimism, fewer mental problems and lower physical suffering related to stronger benefit finding. In the present study, participants reporting benefits also had lower levels of anxiety and irritability. In contrast to our results, a study involving patients suf-

fering from pain related to musculoskeletal disease did not find a relationship between perceived benefits and anxiety or depression (Aytar et al., 2019). However, the results from a meta-analysis revealed an association between higher benefit finding and lower depression, but no relationship between benefit finding and anxiety (Helgeson et al., 2006). In our study, the findings that anxiety was more intense than depressive symptoms, and that median anxiety exceeded the levels indicating pathological anxiety, are worth mentioning. These results are consistent with the higher prevalence of significant anxiety compared to depression observed in a study involving young adults with type 1 diabetes (Downie et al., 2021). Future studies should explore the importance of anxiety for benefit finding, as it has been shown to affect diabetes self-management and glycemic control (Bernstein et al., 2013; Downie et al., 2021). As emphasized by others (de Vries et al., 2019; Helgeson et al., 2006), this association is bidirectional, as benefit finding can reduce negative emotions, and positive affect can promote benefit finding. Longitudinal studies should shed light on this aspect. There is also much debate on the role of time since the traumatic event when considering posttraumatic growth (Helgeson et al., 2006). In the current study, benefit finding was not associated with the duration of diabetes. No associations were noted between perceived benefits and sociodemographic variables.

Health-related benefits were the most common reported benefits in our study sample. Participants noted that, thanks to the disease, they switched to a healthier life-style, including a better diet, participating more in physical activity and health state monitoring. These aspects are undoubtedly important for the management of type 1 diabetes and self-care. A systematic review (Sales-Peres et al., 2016) revealed that life-style factors significantly contributed to better glycemic control among patients with type 1 diabetes, with regular physical activity having the greatest influence. In addition, adolescents and young adults with type 1 diabetes who comply with physical activity recommendations have a better quality of life in comparison to those who do not comply (Mozzillo et al., 2017). One of the reasons for diminished physical activity in diabetic patients may be a fear of hypoglycemia. However, modern technologies used in diabetes therapy may effectively help patients to maintain regular physical activity (Codella et al., 2017). Results from a Danish survey (Ewers et al., 2019), where the authors performed a comparison between patients with type 1 and type 2 diabetes, and healthy individuals, revealed that diabetic patients more commonly follow a healthy diet. This phenomenon may be associated with broader knowledge about a healthy life-style among persons with diabetes. Indeed, this explanation is supported by our findings.

In general, having knowledge that healthy lifestyle is perceived as one of the disease benefits may be used in clinical practice and help health professionals in positive reappraisal of medical recommendations. It seems that presenting them as benefits may contribute to increasing patients' motivation and may improve self-care, lowering the risk of complications. From a patient perspective, perceiving recommendations in a positive way may also increase self-efficacy, decrease anxiety and concern, and may encourage patients to take a more positive approach towards effective self-management, leading to a better quality of life.

In one study, young adults who experienced a serious childhood illness (including diabetes) were asked to describe any positive aspects of having a childhood illness (Devine et al., 2010). A qualitative analysis revealed that personal benefits, such as a positive shift in perspective, higher self-efficacy, an increased appreciation for life and a more empathic approach toward others, were commonly reported. Research on post-traumatic growth among type 2 diabetes patients revealed similar findings (Karimi Moonaghi et al., 2014). These results are in line with ours. However, it seems that, in our study, the perceived benefits spectrum is broader. The personal benefits reported by patients give us the opportunity to acknowledge the extensive influence of chronic diseases on the formation of the self, personality and behaviors. Positive cognitive reappraisal of a disease seems vital in a therapeutic approach (Evers et al., 2001).

The benefits related to social contacts, especially with other diabetic patients, were also often observed in our patients' responses. This finding may indicate the need for such contacts and the high value of peer support among patients with type 1 diabetes. A review of the literature (Litchman et al., 2019) concerning diabetes online communities (DOC) emphasized the benefits of this type of support and showed few negative consequences. Benefits related to DOC engagement included better metabolic control, motivation for positive change, autonomy support, broadening knowledge about the disease, and an increased sense of normality enhanced by sharing experiences with other patients suffering from diabetes. Adolescents with type 1 diabetes are willing to share their experiences related to the disease, especially when they are convinced of benefits related to this activity (Vaala et al., 2018). Some of the participants reported benefits related to participating in camps for persons with diabetes. In one study young participants of the camp reported that thanks to participation, they experienced a decrease in the emotional stress and an increased sense of autonomy and self-efficacy with regard to self-care (Weissberg-Benchell et al., 2019). Participation in group meetings was also associated with an improvement of glycemic control (Due-Christensen et al., 2016). As the described benefits are both subjective and objective, they may motivate spe-

cialists to create group projects or to increase the use of existing areas of support and education to improve the effectiveness of therapy and patient well-being.

Financial benefits were seldom reported by our patients. To the best of our knowledge this subject has not been a focus of diabetes research. Education regarding possible economic benefits offered by the health care system or insurance companies could be useful.

When determining what well-being means to them, adolescents with type 1 diabetes most often refer to physical health, mental balance, a healthy diet, medical recommendations related to the disease, activities allowing one to forget about stress related to diabetes, the ability to influence oneself or others, and relationships with peers and relatives (Fonte et al., 2019). These aspects partly coincide with the categories of benefits mentioned by our respondents. This may indicate the importance of these spheres for a chronically ill person, including patients with type 1 diabetes. This knowledge can assist professionals in planning interventions to improve diabetes control and self-care.

LIMITATIONS

There were some limitations to this study. First, conducting this research via an online survey may have influenced the uniqueness of the study sample. Individuals who use websites related to their disease are probably looking for information and support, which is not apparent in all patients with a particular disease. It is possible that for some of our participants anxiety might be the basis for these activities and for the increased support seeking. However, a recent study revealed that online surveys are an economical and effective form of gaining knowledge regarding diabetic patients' experiences (Gadsby et al., 2017). Another limitation is the overrepresentation of women in our research. Finally, the time of data collection coincided with the publication of information on the SARS-CoV-2 pandemic in Poland, which might also have influenced the findings. As our study is cross-sectional in nature, we therefore cannot reach any conclusion regarding the causality between the studied variables. Thus, the results should be generalized with caution.

STRENGTHS

Our study helps to fill the gap in research exploring the experiences of patients with type 1 diabetes, since such studies are scarce. An online survey, despite its disadvantages, allowed us to gain results from a large group of patients in a safe manner. In addition, a mixed-methods study, especially the use of a qualitative analysis, allowed us to carry out a more comprehensive and in-depth exploration of benefit find-

ing among diabetic patients. The qualitative approach also allowed for better understanding of the individual patient perspective and identified important themes that might have been overlooked when limited to quantitative tests. Aside from the main study aims, the current results also confirmed the psychometric properties of the perceived benefits ICQ subscale.

CONCLUSIONS

In conclusion, the present study revealed that in patients with type 1 diabetes perceived disease benefits are closely related to more positive illness perception and lower levels of negative emotions. Importantly, patients who perceive benefits have a stronger belief of having control over their disease and have stronger conviction of treatment effectiveness. The coexistence of less burdensome symptoms and consequences of the diabetes suggest more effective self-care. The most commonly reported benefits were those related to health, personal growth, extended social contacts and economics. Many patients noted several disease benefits. Our findings also suggest that addressing the potential benefits related to illness may influence the emotional state as noted previously (Rassart et al., 2017; Roepke, 2015). This study also demonstrated the reliability and usefulness of the ICQ subscale among diabetic patients. Taken together, these findings may be useful in clinical practice and allow for the improvement of diabetes management and self-care.

DISCLOSURE

The authors declare no conflict of interest.

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