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Posttraumatic growth in children and adolescents with type 1 diabetes

Potraumatyczny rozwoj u dzieci i młodzieży z cukrzycą typu 1

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STRESZCZENIE

POTRAUMATYCZNY ROZWOJ U DZIECI I MŁODZIEŻY Z CUKRZYCĄ TYPU 1

Cel pracy. Celem pracy było określenie częstości rozwoju potraumatycznego u dzieci i młodzieży z cukrzycą typu 1 oraz określenie związku ze strategiami radzenia sobie.

Materiał i metoda. Grupę badaną stanowiło 102 dzieci w wieku 12-18 lat z rozpoznaną cukrzycą typu 1. Projekt badania miał charakter przekrojowy. Do zebrania danych wykorzystano Kwestionariusz Potraumatycznego Rozwoju Dzieci (PTG-I) oraz Kwestionariusz Sposobów Radzenia Sobie (WCQ).

Wyniki. Sposoby radzenia sobie ze stresem związane są z późniejszym rozwojem potraumatycznym dzieci i młodzieży z cukrzycą typu 1. Najsilniejszą korelację stwierdzono między rozwojem potraumatycznym a strategiami radzenia sobie w poszukiwaniu wsparcia społecznego i planowym rozwiązywaniu problemów. Nie stwierdzono korelacji między rozwojem potraumatycznym a strategią radzenia sobie z ucieczką i unikaniem. Jednak strategia ta była najczęściej stosowana przez młodzież. Nie było różnicy w poziomie rozwoju potraumatycznego ze względu na płeć badanych i ich wiek, z wyjątkiem obszaru Siła Osobista oraz obszaru Zmiana Duchowna.

Wnioski. Ułatwienie przez pielęgniarkę skutecznych strategii radzenia sobie może mieć pozytywny wpływ na potraumatyczny rozwój dzieci i młodzieży z cukrzycą.

Słowa kluczowe: **rozwoj potraumatyczny, dziecko, cukrzyca, radzenie sobie**

ABSTRACT

POSTTRAUMATIC GROWTH IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES

Aim. The study aimed to identify the presence of posttraumatic growth in children and adolescents with the diabetes mellitus type I and to find out relations with coping strategies.

Material and methods. The research group was formed by 102 children aged 12-18 years with diabetes mellitus type I. The research design was a cross-sectional study. The Posttraumatic Growth Inventory for Children (PTGI-C) and the Ways of Coping Questionnaire (WCQ) were used for data collection.

Results. The ways of coping with stress are related to the subsequent posttraumatic growth in children and adolescents with type 1 diabetes. The strongest correlation was found between posttraumatic growth and coping strategies Seeking Social Support and Planful Problem-Solving. The correlation between posttraumatic growth and coping strategy Escape-Avoidance has not been identified. However, this strategy was most often used by adolescents. There was no difference in the level of posttraumatic growth with respect to sex of the respondents and their age, except for the area of Personal Strength and area of Spiritual Change.

Conclusions. The facilitation of effective coping strategies by a nurse can have a positive effect on the posttraumatic growth of children and adolescents with diabetes.

Key words: **posttraumatic growth, child, diabetes mellitus, coping**

INTRODUCTION

Posttraumatic growth refers to positive changes that occur as a result of traumatic or very challenging life events [1]. These changes include, in particular, strengthening the individual's personality, discovering previously hidden abilities and talents, strengthening relationships, and developing a sense of solidarity [2]. Manifestations and results of posttraumatic growth can be divided into these areas: *perception of life* (perception of even the most ordinary things that life brings, individuals value the little things more, things they previously took for granted, they are less stressed by things they cannot influence), *personal strength* (finding new inner strength, attaining more wisdom, more compassion for others, building greater self-confidence), *new opportunities* (new interests, hobbies, new experience, new career opportunities, positive lifestyle changes, choice of alternative path in life), *relations with other people* (appreciation of relationships with loved ones more than before experiencing serious events, awareness of the feeling of interpersonal bonding, prioritization of deep relationships, development of empathy) and *changes in spirituality* (changes in perceptions in terms of spirituality and existential issues of life, often represented by finding a new meaning of life, both for religiously based individuals and for atheistic people) [1, 3]. The disease of one's person is perceived as a serious burdensome situation, especially with regard to chronic or incurable disease [4]. These diseases can be a major shock to the human spirit, and can adversely affect an individual's health and relationships with other people. Nevertheless, a traumatic experience can bring empowerment, lead to improved relationships with other people, lead to a new relationship with one's own body, and positive changes in health-promoting behaviour [5]. Diabetes mellitus is considered to be mentally very demanding. Living with diabetes is difficult at any age, but adolescence is considered to be the most complicated and risky period for patients with type 1 diabetes [6]. During this period, there is a significant decrease in glycaemic control, increased prevalence of depressive symptoms [7], higher levels of anxiety and eating disorders [8]. In their study, in addition to the negative psychological consequences, Tran et al. [9] also identified posttraumatic growth in adolescent diabetics, which was associated with better adherence to the treatment regimen, a lower incidence of depressive symptoms, and better stress management. An active and conscious way of stress and traumatic events management is called coping. Coping can be talked about when the burden is significant, above the limit and the individual is required to make an increased effort (as opposed to adaptation) to cope with it [4]. The study by Al-Yate et al. [10] showed the most commonly used coping strategies used by children and adolescents aged 12-18 with diabetes or asthma, namely coping aimed at escaping the problem. According to Tedeschi et al. [1] the posttraumatic growth is, on the other hand, supported by positive coping strategies, such as problem-oriented coping.

AIM

The study aimed to identify the presence of posttraumatic growth in children and adolescents with the diabetes mellitus type I. diagnosis and to find out relations with coping strategies.

MATERIALS AND METHODS

The research group consisted of 102 children who were diagnosed with diabetes mellitus type I. disease. The research design was a cross-sectional study. Test battery consisting of questionnaires Posttraumatic Growth Inventory for Children (PTGI-C) and the Ways of Coping Questionnaire (WCQ) was used for data collection. The questionnaires were supplemented by questions concerning the sex of the child, his/her age, and the age when the diabetes mellitus was diagnosed. The Posttraumatic Growth Inventory for Children (PTGI-C) questionnaire is a research tool suitable for use in children of at least school age [11]. The questionnaire contains a total of 21 items, each of which being evaluation answers on the Likert scale (1-4), where the lowest answer is marked as completely false, the highest as completely true. The questionnaire consists of five areas of posttraumatic growth: Appreciation of Life, Personal Strength, Relating to Others, New Possibilities, and Spiritual Change. The higher the score, the higher the posttraumatic growth. The questionnaire was used upon previous consent of its authors and after a translation with subsequent back-translation.

The Ways of Coping Questionnaire (WCQ) is a 66-item tool that contains a description of ideas or specific actions that people use to try to cope with stressful situations [12]. The questionnaire is designed to identify specific ways of coping by an individual in specific situations, suitable for children from 12 years of age. The tool includes 8 areas: confrontive coping, distancing, self-controlling, accepting responsibility, seeking social support, escape-avoidance, planful problem solving, and positive reappraisal. The responses are evaluated on a Likert scale (0-3). The questionnaire was used after the previous consent of its authors and a translation with subsequent back-translation. A relative score was calculated, which considers the item length for each subscale. Relative scores were calculated for each participant by averaging the values in each subscale and dividing the average score for each subscale by the sum of the averages for all 8 subscales. The higher the score, the higher the frequency of the coping strategy use.

The research survey took place from November 2020 to February 2021, based on the written consent of the deputies for nursing care in five diabetology outpatient clinics for children and adolescents in the Moravian-Silesian Region. Basic descriptive statistics (arithmetic mean, standard deviation, median) were used to describe the research group. The correlation was evaluated by the Spearman correlation coefficient. Furthermore, a two-sample t-test was used. Data were processed in the NCSS 11 programme. The value of the significance level for testing was α=0,05 (5 %).

RESULTS

The research group included 102 children, of which 47 boys (46 %) and 55 girls (54 %). Children and adolescents aged 12-18 years were enrolled in the research, the average age was 15.7 years (SD=1,4). The average age of diabetes mellitus diagnosis was 9,7 years (SD=4,8) in 83 children (81 %). 19 children (19 %) were not able to determine the age when diabetes was diagnosed.

Posttraumatic growth

The research showed a slightly above-average posttraumatic growth score in children and adolescents in the research group (51 % of the possible maximum) M = 53; SD = 9.9, with a minimum score of 21 and a maximum of 84 (tab. 1). The highest posttraumatic growth was identified in the area of Personal Strength (56 % of possible maximum value). The lowest posttraumatic growth in Spiritual Change (43 % of possible maximum value).

Tab. 1. Posttraumatic growth in children (PTGI-C)

Oblasti PTGI-C (N=102)	M	SD	Median	Min	Max	% of maximum	Scale range
Appreciation of Life	10,0	2,7	10	4	16	53%	4-16
Personal Strength	12,9	3,4	13	5	20	56%	5-20
Relating to Others	15,1	3,3	15	6	23	53%	6-24
New Possibilities	9,1	2,4	9	4	16	46%	4-16
Spiritual Change	3,7	1,6	3,5	2	8	43%	2-8
Overall PTG	53	9,9	54	23	75	51%	21-84

Legend: N – number of respondents, M – mean value, SD – standard deviation, Min – minimal achieved value, Max – maximal achieved value

There was no significant difference between girls and boys in any area of posttraumatic growth or the overall posttraumatic growth score (tab. 2).

Tab. 2. Comparison of posttraumatic growth (PTGI-C) between girls and boys

Areas PTGI-C	Sex	N	M	SD	Median	p-value
Appreciation of Life	Girl	55	10,0	2,5	10	0,906
	Boy	47	9,9	2,9	10	
Personal Strength	Girl	55	13,1	3,2	13	0,451
	Boy	47	12,2	3,6	12	
Relating to Others	Girl	55	14,7	3,3	15	0,245
	Boy	47	15,5	3,3	16	
New Possibilities	Girl	55	9,1	2,4	9	0,753
	Boy	47	9,1	2,4	9	
Spiritual Change	Girl	55	3,6	1,5	3	0,442
	Boy	47	3,8	1,7	4	
Overall PTG	Girl	55	53,1	9,1	53	0,968
	Boy	47	53,0	9,1	53	

Legend: N – number of respondents, M – mean value, SD – standard deviation, p<0,05 – two-sample t-test

To compare posttraumatic growth with respect to age, the research group was divided into age categories 12-14 years (n=21; 21 %), 15 years (n=26; 25 %), 16 years (n= 23; 23 %) a 17-18 years (n=32; 31 %). When compared in the age categories of children, it was found that the highest posttraumatic growth was found in children in the age category of 17-18 years (M=56,5; SD=9,1), the lowest in the age of 16 years (M=52,4; SD=9,4), but this difference was not statistically significant (p=0,136). In the comparison of age categories, significant differences in posttraumatic growth were found in the area of Personal Strength (p=0,007), where the highest growth was achieved by children aged 17-18 years (M=15,2; SD=4,2), and the lowest growth was identified in 16-year-old children (M=12,3; SD=3,2). In the area of spiritual change, children aged 15 and overachieved the most, and children aged 17-18 had the least growth. (p=0,043). There was no significant difference in the age of the child in other areas.

Coping strategies

The most commonly used coping strategy for both girls and boys was Escape-Avoidance, the least used Accepting Responsibility. No significant difference was identified between boys and girls in the coping strategies used (Table 3), but girls more often sought social support and boys a positive reassessment of events.

Tab. 3. Comparison of coping strategies (WCQ) between boys and girls

Areas PTGI-C	Sex	N	M	SD	Median	p-value
Confrontative Coping	Girl	55	7,2	3,6	7	0,969
	Boy	47	7,2	4,0	7	
Distancing	Girl	55	8,2	3,0	8	0,877
	Boy	47	8,3	3,6	8	
Self-Controlling	Girl	55	8,7	3,6	9	0,788
	Boy	47	8,5	3,9	8	
Seeking Social Support	Girl	55	8,2	3,7	8	0,169
	Boy	47	7,6	3,5	7	
Accepting Responsibility	Girl	55	4,8	2,6	5	0,348
	Boy	47	4,3	2,9	4	
Escape-Avoidance	Girl	55	9,7	4,1	10	0,733
	Boy	47	9,5	4,0	9	
Planful Problem-Solving	Girl	55	8,2	3,8	8	0,989
	Boy	47	8,3	3,5	8	
Positive Reappraisal	Girl	55	7,4	3,3	7,5	0,309
	Boy	47	8,1	3,2	8	

Legend: N – number of respondents, M – mean value, SD – standard deviation, p<0,05 – two-sample t-test

The coping strategy Confrontive Coping was significantly the most frequently (p=0,047) used in the age category 15 years (M=8,1, SD=3,7) and the least in the age category 12-14 years (M=5,3, SD=3,5), the coping strategy Positive Reappraisal was also the most frequently used in the age category 15 years (M=10,2, SD=3,4) and the least in the age category 12-14 years (M=6,3, SD=3,5, p=0,017).

The use of other coping strategies did not differ statistically significantly with regard to the age category.

Relationship between posttraumatic growth and coping strategies

All coping strategies, except Escape - Avoidance, were related to posttraumatic growth (Table 4), most of them only at a weak level, but significantly. The coping strategy Seeking Social Support was most related to the overall posttraumatic growth in children with diabetes mellitus (tab. 4), the correlation was at the medium level (r=0,38, p<0,001). The strongest relationships between the individual areas of posttraumatic growth and coping strategies were found in the coping strategy Seeking Social Support, which has a positive effect on growth in the area of Personal Strength (r=0,31, p<0,001), Relating to Others (r=0,34, p<0,001), growth in the area of New Possibilities (r=0,38, p<0,001) and appreciation of life (r=0,26, p=0,010). Confrontive Coping relates to the area of new possibilities (r=0,34, p<0,001), spiritual change (r=0,32, p<0,001) and appreciation of life (r=0,20, p<0,001). Posttraumatic growth in the field of New possibilities was positively related with all coping strategies at a weaker level, but significantly.

Tab. 4. Relationship between posttraumatic growth (PTGI-C) and coping strategies (WCQ)

	Appreciation of Life	Personal Strength	Relating to Others	New possibilities	Spiritual Change	Overall PTGI-C
Confrontive Coping	0,20*	0,08	0,12	0,34*	0,32*	0,25*
Distancing	0,16	0,12	0,12	0,26*	0,17	0,22*
Self-Controlling	0,18	0,17	0,08	0,31*	0,13	0,23*
Seeking Social Support	0,26*	0,31*	0,34*	0,38*	0,11	0,38*
Accepting Responsibility	0,09	0,00	0,06	0,26*	0,14	0,13*
Escape-Avoidance	0,18	-0,01	0,06	0,26*	0,22*	0,16
Planful Problem-Solving	0,22*	0,19*	0,16	0,32*	0,10	0,26*
Positive Reappraisal	0,17	0,15	0,09	0,29*	0,27*	0,23*

Legend: *Spearman correlation coefficient

DISCUSSION

In past years, research focused on the positive impact of challenging life situations on human growth and development was mainly adult-oriented. Currently, attention is also focused on posttraumatic growth in children and adolescents [13]. It turns out that even a chronic disease can be perceived as a trauma in this concept, but it can be transformational for individuals, which means that even a chronic disease can lead to positive changes. This study revealed that there is no difference in posttraumatic growth between girls and boys with diabetes mellitus. The greatest growth was recorded in the area of personal strength, the least in the area of spiritual changes. Similarly, Rassart et al. [14] examined the perceived benefits of diabetics aged 10 to 14 using a questionnaire study and did not find a relationship between the positive consequences of the disease and the gender of the respondents. Taku and McDiarmid [15] in their study of posttraumatic growth of adolescents aged 13 to 19, did not find a relationship between respondents' gender and posttraumatic growth and concluded that these differences did not appear until later in life. When evaluating posttraumatic growth with regard to the age of children and adolescents, differences in posttraumatic growth were found only in the area of strength of personality and spiritual change. Significant growth of personal strength was recorded in the age category of 17-18 years. Spiritual changes developed mainly in children aged 15 years. These age periods are periods full of changes in the physical and psychosocial areas. Adolescents cope with new peer relationships, study activities, and fears about the future. In addition to that, questions of their own identity arise and they search for the meaning of their own existence. There is often comparison and doubt about the faith and values recognized in the family. The result can be final true acceptance or rejection of faith and search for other alternative values. Children and adolescents with diabetes, both girls and boys, in all monitored age categories most often used coping strategy Escape-Avoidance, which is focused on emotions. In adolescents with diabetes, this is associated with worse metabolic control and treatment adherence [16]. Similarly, Pisula and Czaplinska [17] found frequent use of the Ignore the problem and Avoidance oriented coping strategy in adolescents, both in adolescents with diabetes and in healthy peers. According to Medveďová [18], the choice of coping strategy for children and adolescents depends mainly on the coping strategies used in their family. This opinion is also shared by Pisula and Czaplinska [17] who confirmed the relationship of coping of mothers and their children with diabetes. Therefore, children and adolescents, but also their parents need to be educated in more effective strategies of coping with stressful situations. Communication skills training and cognitive-behavioural interventions such as coping skills training focus primarily on improving behavioural skills necessary to self-manage and achieve better glycaemic and psychosocial outcomes in patients with diabetes. In the lower age group of 12-14 years, there was less use of Confrontive Coping and Positive Reappraisal strategies, which may be related to the cognitive development of children.

As this study has shown, posttraumatic growth is related to the coping strategies used by children and adolescents to cope with difficult life events. This relationship has also been confirmed in a study by Meyerson et al. [13] and Zeligman et al. [19]. In our study, we found a relationship between posttraumatic growth and all strategies except for one, which was the Escape-Avoidance strategy. This strategy is therefore ineffective for posttraumatic growth. Due to its most common use in our group of children and adolescents, education on a more effective

way of coping is necessary. Al-Yateem et al. [10] point out that adolescents suffering from chronic diseases are more prone to adopt ineffective coping strategies. Posttraumatic growth was most strongly related to the coping strategy Seeking Social Support, as noted in the Prati, Pietrantoni survey [20], which analysed 103 papers on the relationship between posttraumatic growth and coping and therefore, children and adolescents can be supported in these activities.

CONCLUSIONS

Perception of positive changes or benefits arising from type 1 diabetes mellitus can provide adolescents, among other things, with space for personal growth, the formation of their own identity, and the search for a new meaning that helps to better confront the disease. This process can help them alleviate fears about the future of chronic disease, making life choices that will be more effective in managing the disease. Given the identified positive links between posttraumatic growth and positive coping strategies, it is appropriate to facilitate posttraumatic growth by nurses, e.g. by talking to the child, creating a sense of security and safety, providing social support, learning new coping strategies, and helping to find new values, balancing what diseases has not changed, by providing opportunities to confide, by gaining a positive view of oneself and by taking responsibility for one's life with the disease.

Implications for nursing practice

Evaluation of coping strategies and posttraumatic growth in children with diabetes mellitus by child nurses in outpatient clinics.

Creation of support programmes to develop effective coping strategies in children and adolescents.

Development of social support for children and adolescents with diabetes mellitus and support of cooperation with a multidisciplinary team taking care of the child mental health.

Education of nurses in the issue of posttraumatic growth and use of effective coping strategies in child age as well as adolescent age.

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