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Life orientation and chosen sociomedical indicators of women suffering from type 2 diabetes

Orientacja życiowa i wybrane wskaźniki społeczno-medyczne u kobiet chorych na cukrzycę typu 2

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Słowa kluczowe: poczucie koherencji, kobiety, cukrzyca typu 2, wskaźniki społeczno-medyczne

Key words: sense of coherence, women, type 2 diabetes, sociomedical indicators

Streszczenie

Wstęp i cel pracy. W procesie codziennego radzenia sobie z cukrzycą ważną rolę odgrywa poczucie koherencji. Konstrukt ten w teorii salutogenezy wskazuje na zdolność jednostki do umiejętnego wykorzystywania zasobów dla własnego dobrego samopoczucia. W wielu pracach analizowano wpływ czynników demograficznych, społecznych i klinicznych na poziom poczucia koherencji w grupie chorych na cukrzycę. Jednak niewiele miejsca

poświęcono na szczegółowe omówienie tego zagadnienia w populacji kobiet chorych na cukrzycę. Celem pracy było określenie związku między poziomem poczucia koherencji a wybranymi zmiennymi społeczno-medycznymi w grupie kobiet chorych na cukrzycę typu 2

Materiał i metoda badawcza. Grupę badaną stanowiło 131 kobiet chorych na cukrzycę typu 2, które były leczone w Poradni Diabetologicznej i Klinice Endokrynologii. Do badania zakwalifikowano kobiety będące powyżej 40 roku życia, z cukrzycą trwającą powyżej 1 roku i które wyraziły zgodę na udział w badaniu. Zastosowano kwestionariusz własnej konstrukcji zawierający dane dotyczące: wieku, wykształcenia, miejsca zamieszkania, stanu cywilnego, aktywności zawodowej. Autorski kwestionariusz pozwolił na pozyskanie informacji medycznych, takich jak: czas trwania choroby, wskaźnik BMI, wartość $HbA_{1c,}$ metoda leczenia cukrzycy. Do oceny poziomu poczucia koherencji wykorzystano Kwestionariusz Orientacji Życiowej (SOC-29) autorstwa A. Antonovskiego w polskiej wersji.

Wyniki. Poziom poczucia koherencji respondentek zawierał się w przedziale od 47 do 197 pkt. Nie wykazano statystycznie istotnych różnic ($p > 0,05$) w wynikach oceny poziomu poczucia koherencji a miejscem zamieszkania, wykształceniem, stanem cywilnym. Brak istotnych ($p > 0,05$) zależności między poziomem poczucia koherencji i jego trzech wymiarów a metodą leczenia, wartością HbA_{1c} i czasem trwania choroby. Stwierdzono istotną ($p < 0,05$) statystycznie różnicę między wynikiem średniej poziomu poczucia koherencji i jego komponentami a wiekiem. Wykazano zależność istotną ($p < 0,05$) statystycznie pomiędzy poczuciem sensowności a wskaźnikiem masy ciała. Stwierdzono istotną ($p < 0,05$) statystycznie różnicę między poziomem poczucia koherencji i jego składowymi a aktywnością zawodową kobiet badanych.

Wnioski: 1.U kobiet chorych na cukrzycę typu 2 poziom poczucia koherencji był niższy od norm przeciętnych założonych przez A. Antonovsky'ego (133-160 pkt.). 2. Kobiety pracujące zawodowo i w wieku dojrzałym wyróżniały się wysokim poziomem poczucia koherencji i jego składników. 3. Kobiety chore na cukrzycę typu 2 z prawidłową masą ciała cechowały się wysokim poziomem poczucia sensowności.

Abstract

The aim of the study: In the process of dealing with diabetes every day the sense of coherence plays an important role. This construct in the salutogenesis theory determines the ability ofan individual to skilfully utilize the available resources for their own wellbeing. In many works the influence of demographic, social and clinical factors on the sense of coherence of people suffering from diabetes was analysed. However, little attention was paid to the detailed description of this issue among women suffering from diabetes. The aim of the study was to determine the relationship between the sense of coherence and the chosen sociomedical variables among women suffering from type 2 diabetes.

Material and methods: In total 131 women suffering from type 2 diabetes treated at the Endocrinology Hospital and the Diabetes Outpatient Clinic were the subject of this research. The women who were selected for this research were 40 years old, had suffered from diabetes for over one year and gave permission to take part in the study.The study was conducted based on the original questionnaire comprising the data concerning: age, educational background, place of residence, marital status and professional activity. The questionnaire allowed gathering medical data like: duration of the disease, BMI index, HbA_{1c} value or the method of diabetes treatment.Life Orientation Questionnaire (SOC-29) by A. Antonovski [4] in a Polish language version was used to determine the rating of the sense of coherence.

Results. The level of the sense of coherence of the surveyed women suffering from diabetes was between 47 and 197 points. Statistically significant differences were not observed ($p > 0.05$) in the ratings of the sense of coherence versus the place of residence, education or marital status. There were no significant relationships ($p > 0.05$) between the sense of coherence, its components and the method of treatment, HbA_{1c} value and the disease duration time. A statistically relevant difference ($p < 0.05$) between the sense of coherence, its components and the age of respondents was demonstrated. Moreover, a statistically relevant difference was proven ($p < 0.05$) between the sense of coherence and Body Mass Index. Furthermore, a statistically significant difference ($p < 0.05$) between the sense of coherence, its components and the professional activity of the research subjects was found.

Conclusions: 1.The level of sense of coherence was lower than the standard average norms as applied by A. Antonovsky (133-160 points) among women suffering from type 2 diabetes. 2. Women who were professionally active and mature stood out with a high level of the sense

of coherence and its components. 3. Women suffering from type 2 diabetes with normal body weight had high a level of the sense of coherence.

Introduction

Economic, social and environmental transformations have influenced numerous changes in people's lifestyle in recent years, which in turn resulted in the rise in the frequency of diseases of affluence [23,27,29]. Nowadays, diabetes has become one of the greatest health crises in the world. It is estimated that around 420 million people suffer from diabetes worldwide [15]. Diabetes often causes emotional and behavioural problems among those suffering from it. In the process of dealing with the disease the sense of coherence is crucial [7,11]. This sense constitutes a basis for the salutogenic model devised by A. Antonovsky. [4,16,30]. The sense of coherence determines the way we perceive our lives and our surroundings, as well as determines the way we deal with difficult and stressful situations [3,4]. In the structure of the sense of coherence we can distinguish between three dimensions: comprehensibility, manageability and meaningfulness [2,4,5]. Comprehensibility concerns the ability to receive stimuli from the inner and outer surroundings in a clear, organised and orderly way [30]. Manageability means perceiving available resources as sufficient and appropriate for dealing with difficulties [16]. Meaningfulness concerns the degree to which one believes that hard shipmakes sense and are worth the effort and involvement [4].

The sense of coherence influences the patients' health in conjunction with other important factors and patients' regulatory mechanisms [16,31]. According to Antonovsky these factors include: generalised resistance resources (GRR), stressors, behaviour and lifestyle. Generalised resistance resources concern the disposition of a person and of its environment, and include: biological factors (genetic, biochemical, constitutional), mental factors (sense of control, sense of identity, intelligence, knowledge), material and financial conditions, sociocultural factors (social support, philosophy, art, religion) [4,8,30]. In the discussed theory stressors can stem from an individual themselves, or from the environment. There are two types of stressors – physio-biological (e.g. droughts, threats to the environment, diseases) and psychosocial (social conflicts, hardship). With respect to the duration time they can have a

cute, chronic or interim character [14]. According to Antonovsky, behaviour and lifestyle depend largely on cultural and socio-structural conditions [4,10].

Theoretical assumptions of the sense of coherence have their reflection in the result sof the studies carried out among people suffering from diabetes. Some researchers suggest that disease burden among people suffering from diabetes can be modified by improving the level of the sense of coherence [25]. In a number of research papers the influence of socio-clinical factors on the level of the sense of coherence among the patients with type 1 and 2 diabetes was analysed [1,6,13,25]. However, the majority of work on this topic does not target the population of women suffering from diabetes specifically. The following study constitutes an attempt to enrich this field of knowledge.

The aim of the study was to determine the relationship between the sense of coherence and selected sociomedical variables among women suffering from type 2 diabetes.

Material and methods

In total 131 women suffering from type 2 diabetes treated at the Endocrinology Hospital and the Diabetes Outpatient Clinic were the subject of this research. The women selected for this research were over 40 years old, had suffered from diabetes for over one year and gave permission to take part in the study. The Bioethical Commission gave approval to the study with a positive opinion no. KE-0254/111/.

The study was conducted based on the original questionnaire comprising the data concerning: age, education background, place of residence, marital status and professional activity. The questionnaire also allowed gathering medical data like: the duration of the disease, BMI index, HbA_{1c} value or the method of diabetes treatment.

Life Orientation Questionnaire (SOC-29) by A. Antonovski [4] was used to determine the rating of the sense of coherence. The Polish language version was devised by J. Koniarek, B. Dudek and Z. Makowska [16]. The presented questionnaire encompasses 29 positions, each estimated on 1 to 7 scale. The obtained sum of the points ranging from 29 to 203 reflects the overall level of sense of coherence. Moreover, the questionnaire allows measuring comprehensibility (C), manageability (MA) and meaningfulness (ME) [4,2].

The characteristics of the studied group

Women suffering from type 2 diabetes who participated in the study were from 40 up to 84 years old. The average age of the group was 61.83 (*SD* ± 8.34). In the researched population the largest age group was 61-70, and the smallest one was women below 50 (9.90%). The distribution of the age groups is presented on Figure 1.

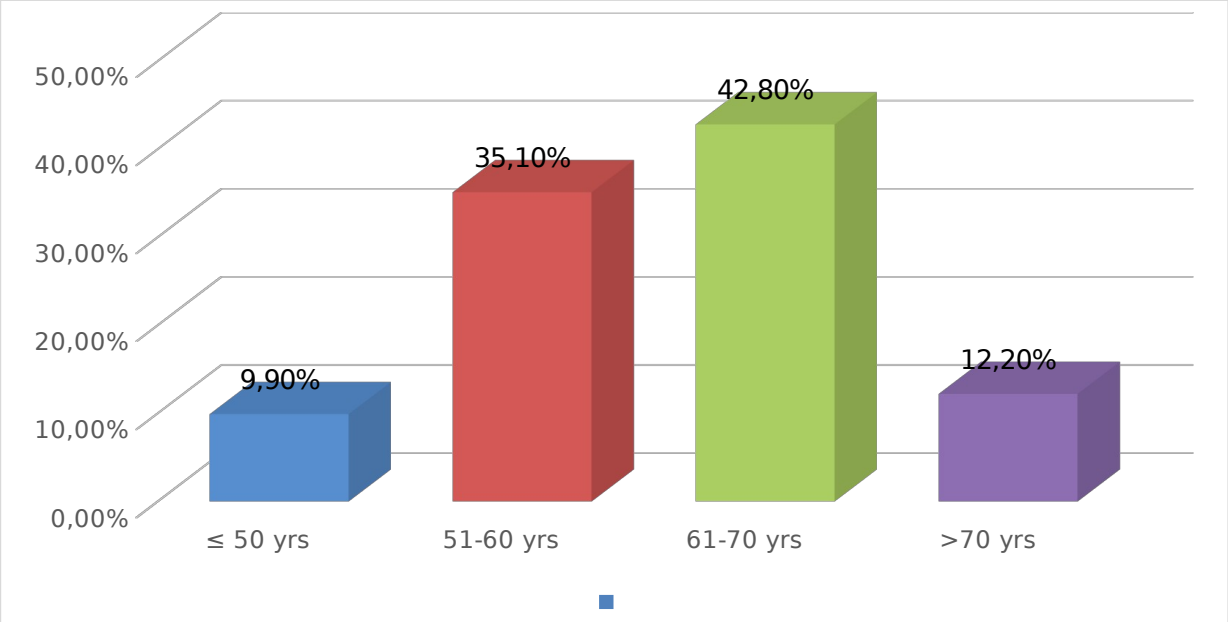

Figure 1. The distribution of age groups among the researched population of women suffering from type 2. diabetes (Source: original study).

The majority (64.89%) of respondents lived in urban areas (Figure 2.). The researched group of patients most often (42.75%) had high school education. The smallest proportion (14.50%) of respondents had primary education.

The analysis of the obtained data showed that women in domestic partnerships constituted the majority of the researched group (64.89%). More than a half (53.40%) of the researched group were retired, and 3.8% of women were unemployed. The professional activity background distribution is shown on Figure 2.

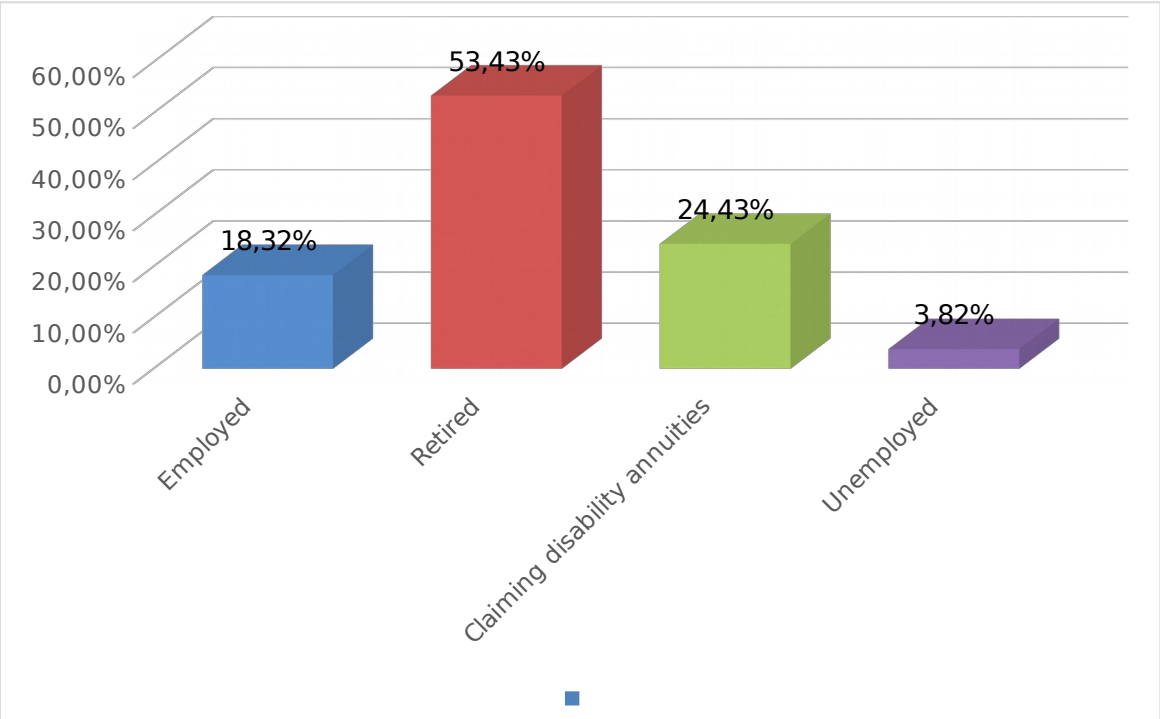

Figure 2. Professional activity of the researched women (Source: original study)

In the researched group the average Body Mass Index (BMI = kg/m^2) was 32,13 (*SD*±6,75). The respondents diagnosed with obesity constituted the majority of the studied group (64.12%). It was ascertained that the absolute majority (88.55%) of the research subjects were diagnosed with nutrition disorders (extra weight, obesity). Detailed extra weight and obesity distribution is depicted on Figure 3.

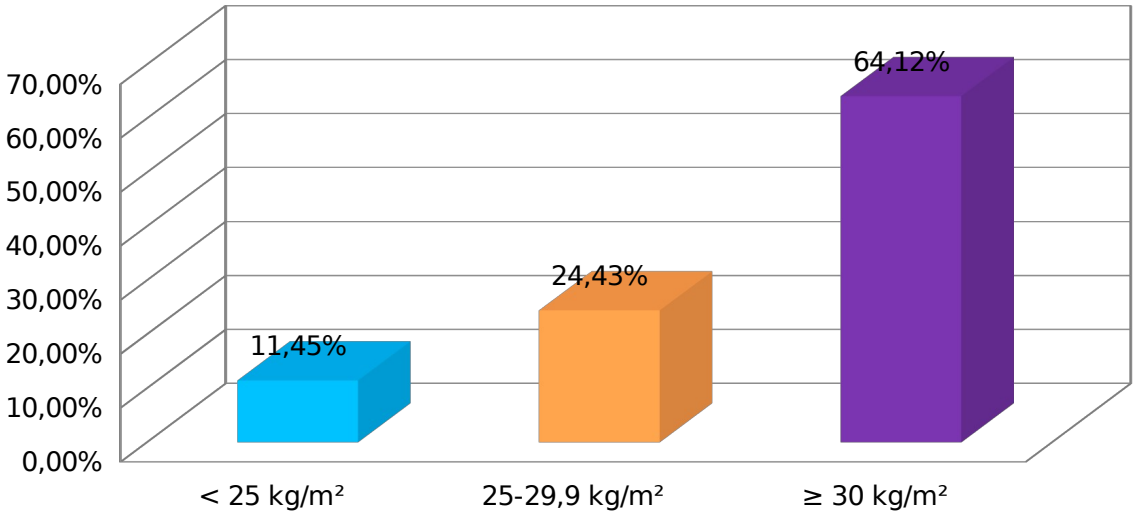

Figure 3. Distribution of excess weight and obesity based on BMI in the researched group of women (*N* = 131) (Source: original study)

In the researched group of women suffering from diabetes the average duration time of the disease was 11.56 years (*SD*±7.76). The duration time from 1 to 10 years was declared in more than a half of answers (54.20%) of women. The smallest group (14.50%) of women suffered from type 2 diabetes for more than 20 years.

The women who were treated with pharmacological combination treatment (insulin + antidiabetic medicine orally) were the biggest group (37.40%). 3.82% of the research group at the time of conducting the research were treated with behavioural therapy.

In the researched group of women suffering from diabetes the average glycated haemoglobin (HbA_{1c}) expressed in percentage was 7.89±1.78. The majority of patients (64.12%) had their glycated haemoglobin levels at above 7%.

The results of the study

In the researched group of women suffering from type 2 diabetes the sense of coherence was measured using SOC-29 The Sense of Coherence Questionnaire. Table 1. presents the results of the conducted study (*N* = 131).

Table 1. The sense of coherence and its components among the researched group of women suffering from diabetes (*N* = 131)

	M* ± *SD	***Me***	***Min-Max***
Global sense of coherence	131.18 ± 27.39	131	47-197
Comprehensibility (C)	3.91 ± 1.06	3.90	1.00 - 6.82
Manageability (MA)	4.72 ± 0.98	4.70	1.60 -7.00
Meaningfulness (ME)	5.06 ± 1.10	5	1.88 -7.00

Note: M – mean, SD – standard deviation, min – minimum, max – maximum; (Source: original study)

The level of the sense of coherence of the surveyed women suffering from diabetes was between 47 and 197 points. The average of the results was *M* = 131.18. As for the components of the sense of coherence, the highest average rating was for the meaningfulness component (*M* = 5.06), and the lowest rating was for the comprehensibility component (*M* =3.91).

In order to determine the relationship between the sense of coherence and its components, and the age of the researched patients one-way analysis of variance was used. A statistically significant difference ($p < 0.05$) was observed as a result of the average between the age and the level of the sense of coherence and its components. Women participating in the study who were younger than 51 years old declared the lowest average level of sense of coherence and its components.

Table 2. The sense of coherence and its components versus the age of women suffering from type 2 diabetes ($N = 132$)

Variable	Groups	C		MA		ME		GSOC	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age	Group I ≤ 50 yrs	2.95	1.20	3.81	1.05	4.13	1.14	103.55	30.61
	Group II 51-60 yrs	4.04	1.02	4.92	0.89	5.41	0.91	138.51	25.56
	Group III 61-70 yrs	4.01	1.04	4.77	0.97	5.07	1.06	132.32	25.46
	Group IV >70 yrs	3.80	0.89	4.59	0.95	4.62	1.27	124.63	25.91
	F(3, 127)	3.67		4.26		5.67		5.77	
	p<	0.014*		0.001**		0.001**		0.001**	

Note: C - comprehensibility , MA – manageability, ME – meaningfulness, GSOC – global sense of coherence, *M* – mean, *SD* – standard deviation, *p<0.05, **p<0.01; (Source: original study)

The post-hoc comparison enables us to conclude that women from age group I have the lowest average sense of coherence. It is statistically different ($p < 0.05$) from the averages of answers as declared by women from age groups II, III and IV.

The post-hoc test in the comprehensibility domain indicated the importance of comparison between the averages of age group I and age groups II, III and IV.

In the meaningfulness domain the post-hoc test showed that the averages obtained by women from age group I are significantly different ($p < 0.01$) from the averages of age groups II and

IV. Furthermore, the test indicated the significance of the comparison of the averages of age groups II and IV.

In the manageability domain the post-hoc tests pointed out the statistically significant difference ($p < 0.01$) between the averages obtained by women from age group I and the age groups II, III and IV.

In order to estimate the relationship between the sense of coherence and its components, and the place of residence of the respondents, the point biserial correlation coefficient was used. No statistically important differences were noted in the results of the level of the sense of coherence ($p > 0.05$).

To analyse the relationship between the sense of coherence, its components and the level of education of the researched women, the one-way analysis of variance was used. The analysis did not show any statistically relevant differences ($p > 0.05$) in the averages of the discussed groups.

In order to verify whether the sense of coherence and its components depend on the marital status of the researched group of women, the point biserial correlation coefficient was used for statistical calculations. The analysis did not show any statistically relevant ($p > 0.05$) relationship between those two variables.

To determine the relationship between the sense of coherence, its components and the professional activity of the research subjects, the one-way analysis of variance was used. One statistically relevant difference ($p < 0.05$) between the average level of the sense of coherence, its components and professional activity was observed. The women who were employed obtained the highest average levels of the sense of coherence and of its components. The details of the aforementioned analysis are included in Table 3.

Table 3. The sense of coherence and its components versus the professional activity of women suffering from type 2 (*N* = 132)

Variable	Groups	C		MA		ME		GSOC	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Professional activity[(a)]	Employed women Group I	4.37	0.98	5.15	O.87	5.69	0.78	145	23.09
	Women claiming disability annuities Group II	3.43	1.11	4.36	1.03	4.64	1.14	119	29.00
	Retiredwomen GroupIII	4.01	1.02	4.77	0.95	5.04	1.10	133	25.97
	F(2,123)	6.02		4.78		6.69		6.86	
	p<	**0.003****		**0.010***		**0.001****		**0.001****	

Note: C - comprehensibility , MA – manageability, ME – meaningfulness, GSOC – global sense of coherence, *M* – mean, *SD* – standard deviation; * $p<0.05$; ** $p<0.01$; (a) 5 women who were unemployed were not considered in this part. (Source: original study)

Later on, it was checked which averages of the groups of women's professional activity are significantly different from each other. By means of the post-hoc test it was shown that the averages of the general sense of coherence of group I (employed women) are significantly statistically different ($p < 0.01$) from the averages of the group II (claiming disability annuities). In turn, the averages of group II are significantly different ($p < 0.01$) from the averages of groups I and III.

With the aid of the post-hoc test it was proven that the averages of the level of sense of coherence among the employed women from group I are significantly different ($p < 0.01$) from the averages obtained by the women claiming disability annuities. In turn, the averages obtained by the women claiming disability annuities are significantly statistically different ($p < 0.05$) from the average levels of comprehensibility for the group of the retired women.
The post-hoc test was also used for determining the differences between the average levels of manageability among the aforementioned groups. The conducted analysis allows stating that

women from group I (employed) have the highest average level of manageability and it is statistically significantly different from the average of group II (women claiming disability annuities).

In the meaningfulness domain post-hoc tests indicated that the average results obtained by women from group I (employed) are statistically different from the average of group II (women claiming disability annuities).

In order to determine the relationship between nutrition according to BMI indicator and the sense of coherence and its components (comprehensibility, manageability and meaningfulness) in the researched group of women suffering from diabetes, Spearman's rank correlation coefficient (Spearman's *rho*) was used. The relationship which was statistically relevant ($p < 0.01$) was observed only in one case of between meaningfulness and BMI. The stated correlation was weak and negative ($rho = -0.20$). The higher the BMI, the lower the meaningfulness of the respondents.

It was verified whether there is any relationship between the global sense of coherence, its components and the duration of the disease. This part of the study was conducted based on the one-way analysis of variance. There wasn't a statistically significant ($p > 0.05$) correlation between the global sense of coherence, its components and duration of the disease. Similarly, there wasn't statistically significant ($p > 0.05$) difference between global sense of coherence, its components and the method of treatment. For the aforementioned correlation between two variables the one-way analysis of variance was used as well. In order to ascertain the correlation between the sense of coherence, its components and the level of glycated haemoglobin (HbA_{1c}) Spearman's *rho* was used. There were not observed any significant ($p > 0.05$) relationships between the discussed variables.

Discussion

The sense of coherence of women suffering from type 2 diabetes was rated using Life Orientation Questionnaire (SOC-29). The correlations between the level od sense of coherence and presupposed sociomedical variables were verified. According to Antonovsky [3,4] the average sense of coherence oscillates between 133 and 160 points. From the conducted analysis it follows that the average level of sense of coherence of the researched group of women was slightly lower than the aforementioned standard norms. It is consistent

with the results of other studies showing that women suffering from chronic diseases usually declare a lower level of the sense of coherence, between 100 and 133 points [9,22]. In the studies conducted by Mathu (and others) [21] among the groups of people suffering from diabetes and those who do not suffer from diabetes, the average level of the sense of coherence of women suffering from diabetes was the lowest one. However, in the studies by Kurowska (and others) [17] the average in the general range of SOC of women suffering from type 2 diabetes was higher than the one obtained in the original study. Out of three components in this study, the respondents obtained the highest average in the meaningfulness domain. Similarly, in the scientific literature meaningfulness is considered the most important component in the structure of the sense of coherence and it decides about its global level [16].

According to Antonovsky [4], the sense of coherence stabilises at around 30 years of age. In the original research this hypothesis did not hold. Women at the pre-retirement age obtained the statistically significant ($p < 0.05$) highest results in the domain of the sense of coherence and its dimensions. It seems to be connected to achieving life stability and finding meaning in life regardless of the hardships resulting from the disease [12]. Similarly in the studies conducted by Sardu (and others) [28] and Odajim and Sumi [25] it was documented that the level of the sense of coherence rises with age.

In this study the global sense of coherence and its components did not differ significantly ($p < 0.05$) as juxtaposed with the place of residence. Sources which could enrich this area of study were not found. However, it is worth considering the results of Ziarko (and others) [33] carried out among those suffering from type 1 diabetes; people living in the rural areas declared lower average levels of coherence compared to people living in the urban areas.

The data from this research did not confirm relevant correlations between the sense of coherence and the level of education, or marital status, in the researched group of women suffering from diabetes. Likewise, in the study by Paik V. (and others) [26] it was stated that the marital status of female respondents did not influence the level of the sense of coherence, whereas women with higher education had a strong sense of coherence.

The analysis of the research demonstrated that women claiming disability annuities declared a weak level of coherence on the global scale, as well as in each of the three components (comprehensibility, manageability and meaningfulness). In the study by Merakou (and others) [22] the professional activity constituted an important factor of the level of the sense of

coherence. On the other hand, the study by Kurowska (and others) [17] did not confirm the relationship between the aforementioned variables.

The in-depth analysis of the results in the original study demonstrated that respondents who declared a strong sense of coherence had proper body weight. Nuccitelli (and others) [24] among people suffering from type 1 diabetes observed relevant correlation between the high levels of the sense of coherence and low BMI indices. Another result was achieved by Kurowska (and others) [17] in the whole group of people suffering from type 2 diabetes, where BMI did not influence the sense of coherence and its components significantly. It is worth quoting the results of the study by Linfors (and others) [19] among women not suffering from diabetes, in which there were no relevant differences between BMI and the level of the sense of coherence.

In the original research there was no significant correlation between the global sense of coherence and its dimensions, and the duration time of the disease among the respondents. Similar results were achieved in the research by Kurowska (and others) [17], however, it was conducted in the group of people suffering from type 2 diabetes . In another study conducted among a similar population of people suffering from the disease a significant positive correlation (r = 0,66, p< 0, 05) between the discussed variables [20].

In the original study the methods of treatment of diabetes applied to the researched group of women did not have a relevant connection to the strength of the sense of coherence. The obtained results were consistent with the study by Kurowska (and others) [17] conducted among the population of people suffering from type 2 diabetes, in which the method of treatment did not influence the level of sense of coherence and its components substantially.

A further analysis of there search material in the original study did not confirm a relationship between the concentration of glycated haemoglobin and the sense of coherence in the group of respondents. The achieved results correspond with the results of the study by Wainwright (and others) [32].

Conclusions

1. The level of sense of coherence was lower than the standard average norms as applied by A. Antonovsky (133-160 points) among women suffering from type 2 diabetes.

2. Women who were professionally active and mature stood out with a high level of the sense of coherence and its components.
3. Women suffering from type 2 diabetes with normal body weight had high a level of the sense of coherence.

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