

Mental health of patients suffering from connective tissue diseases. Negative and positive concept and selected correlates

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Summary

Aim. The purpose of the research was to assess mental health of people suffering from connective tissue diseases, both in negative terms, i.e., the presence of disorders, and in positive terms – patients' well-being. Due to the specificity of connective tissue diseases, among others their unpredictable course and the pain that often accompanies patients, selected clinical and sociodemographic variables were included in the analyses.

Method. 101 people participated in the study, 81 women and 20 men aged 18 to 57 years, suffering from various connective tissue diseases. Some people completed questionnaires during support group meetings (38.6%), others via the internet. The HADS–M scale was used to examine indicators of mental health in negative terms, the PERMA–Profiler questionnaire was used to assess well-being (an indicator of mental health in positive terms), and the authors' own survey was used to obtain clinical and sociodemographic data.

Results. Subjects suffering from connective tissue diseases are characterized by high severity of anxiety and depressive symptoms. Relationships between mental health and selected clinical and sociodemographic variables were observed, e.g., greater pain is associated with higher rates of anxiety and depression, and lower well-being; the level of well-being increases with age.

Conclusions. It is important to monitor the mental health of people with chronic somatic diseases, including connective tissue diseases, especially in young people at the initial period of the disease, suffering from severe pain, residents of villages and small towns where access to support is limited.

Key words: mental health, mental well-being, connective tissue diseases

Introduction

Connective tissue diseases are a group of autoimmune diseases with unspecified etiology and unclear pathogenesis (genetic, infectious and environmental origin of the disease) [1]. The disease process can involve both individual organs and systems, as well as entire groups of them [1, 2]. In the group of systemic connective tissue diseases covered by this study, the most common disorder is rheumatoid arthritis [3, 4].

The treatment of rheumatic diseases boils down to the use of glucocorticoids and interferon alpha. These medicines have a number of side effects, including those in the area of mental health, mainly in the form of mood and cognitive disorders. Cognitive impairment is almost universal (in 75% of patients with glucocorticoids) and includes mainly deterioration of attention and visual-spatial functions, and memory impairment [3, 5]. Their occurrence or severity depends on the type of disease. In addition, glucocorticoid-based pharmacotherapy may initiate depression or aggravate its symptoms. It should also be noted that the treatment of people suffering from rheumatoid arthritis with comorbid depression is less effective [6]. Other psychiatric complications caused by glucocorticoid treatment include psychomotor agitation, confusion and disorientation [7]. The course of connective tissue diseases (including their unpredictability and accompanying pain) and the effects they cause in the functioning of the patients (e.g., limitation of mobility) are also associated with the occurrence of psychological problems. Mood disorders, anxiety disorders, sleep disorders, psychotic disorders, cognitive disorders, personality and behavioral disorders as well as depersonalization are mentioned among the most common disorders related to mental functioning of people suffering from connective tissue diseases [3]. In view of the above, the mental health of patients with connective tissue diseases should be monitored with special care.

Mental health is a state of good emotional well-being that allows one to function effectively in the environment, and achieve life goals and full self-development. Two concepts of mental health should be taken into consideration – negative and positive. Mental health defined in negative terms is the absence of a disease, mental disorder or mental dysfunction whose criteria are described in various classifications, e.g., ICD-10. A positive view of mental health is ambiguous and relates to concepts such as life satisfaction, self-fulfilment, happiness and mental well-being. It also includes such behavior and personality traits that are associated with the ability to cope in difficult situations [8, 9]. An example of a positive concept of mental health is Martin Seligman's well-being theory and the PERMA model [10, 11]. Well-being is understood as a construct that consists of independent and measurable elements. The PERMA model consists of five constructs, namely: positive emotions (P), engagement (E), positive relationships (R), meaning (M) and accomplishments/achievements (A). The search for positive emotions applies not only to the present but also to the past and the future.

The aim of the current study is to assess mental health in negative and positive terms in a group of adults suffering from connective tissue diseases, and to evaluate its selected clinical (related to a chronic somatic disease) and sociodemographic correlates. The study attempted to answer several research questions:

1. How is the mental health of people with connective tissue diseases (both anxiety/depression and well-being)?
2. Do selected clinical variables (the type of disease, duration of disease, severity of pain symptoms) differentiate the studied patients in terms of mental health?
3. Do selected sociodemographic variables such as gender, education, place of residence, economic activity differentiate the examined patients in terms of mental health?

Material and methods

The study included 101 participants, 81 women and 20 men aged 18 to 57 years ($M = 33.03$; $SD = 8.07$). The unequal size of groups is associated with, among others, the specificity of disease occurrence and the higher percentage of women in support groups. The study was conducted using the paper-and-pencil method (39 people, members of the Polish Association of Young People with Connective Tissue Diseases “3majmy się razem”) and online (62 people) using the Profitest.pl platform in the period from November 2018 to February 2019. Online respondents belonged to an online support group of people with connective tissue diseases, in which a link to the study was placed. The criteria for inclusion in the study group were the individual’s declaration of suffering from one of the connective tissue diseases as well as their readiness to participate in the study and identification with the study group.

All subjects consented to their participation in the study and did not receive remuneration. Most of the respondents lived in a city, had secondary or higher education and were economically active. During the study, all of the participants were treated as outpatients. Detailed data concerning sociodemographic variables are presented in Table 1.

Table 1. Sociodemographic characteristics of the respondents

Variable		Values
Gender:	Female	N = 81 (80.2%)
	Male	N = 20 (19.8%)
Age (in years):		M = 33.03
		SD = 8.07
		min = 18
		max = 57
	Women	skewness = 0.28
	Men	kurtosis = - 0.232
Type of questionnaire:	"Paper and pencil" questionnaire	N = 39 (38.6%)
	Online questionnaire	N = 62 (61.4%)
Education:	Primary	N = 0
	Lower secondary	N = 1 (1%)
	Basic vocational	N = 5 (5%)
	Secondary	N = 43 (42.6%)
	Higher	N = 52 (51.5%)
Place of residence:	The countryside	N = 17 (16.8%)
	Town with a population under 50,000	N = 14 (13.9%)
	Town with a population of 50-100,000	N = 16 (15.8%)
	City with a population of 100-250,000	N = 18 (17.8%)
	City with a population of over 250,000	N = 36 (35.6%)
Marital status:	Single	N = 44 (43.6%)
	Married	N = 47 (46.5%)
	Divorced	N = 9 (8.9%)
	Widowed	N = 1 (1%)
Work status:	Student	N = 20 (19.8%)
	Employed	N = 65 (64.4%)
	Unemployed	N = 8 (7.9%)
	Unable to work	N = 8 (7.9%)

Most subjects claimed to have rheumatoid arthritis, systemic lupus erythematosus, ankylosing spondylitis, and juvenile idiopathic arthritis. Detailed data are presented in Figure 1.

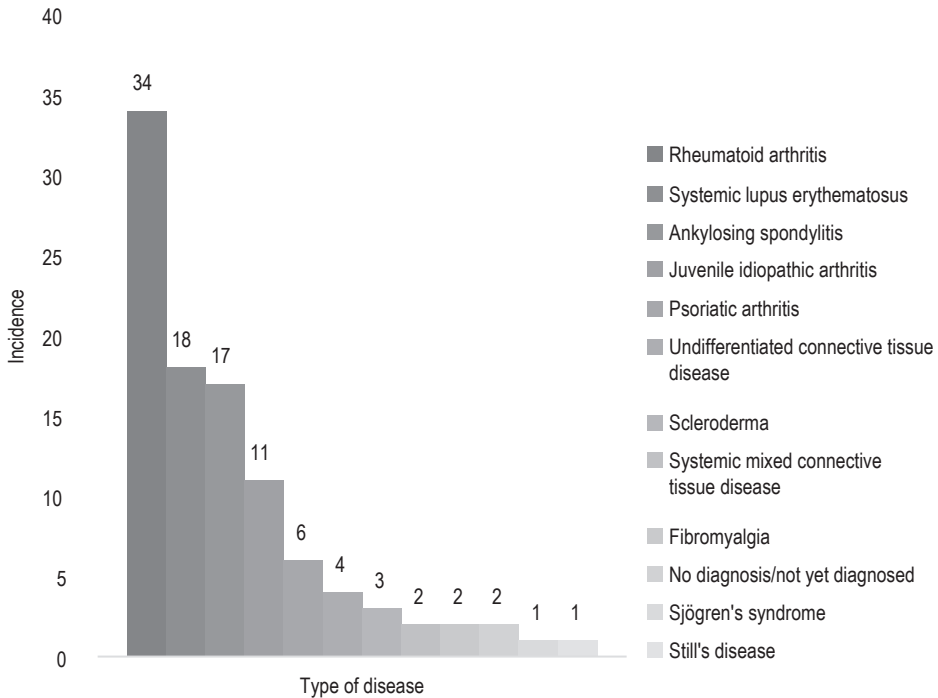


Figure 1. Incidence of declared connective tissue diseases in the study group

The duration of disease in the study group ranged from 0.5 to 50 years ($M = 8.94$; $SD = 8.75$). Most of the respondents were in a relationship ($N = 81$; 80.2%).

Several questionnaires were used in the study, including:

1. The authors' own sociodemographic survey, which included questions regarding demographic variables, such as gender, age, marital status, work status; and questions concerning clinical variables, such as the type of disease, duration of disease.
2. The PERMA-Profler (PL) questionnaire, developed by Butler and Kern [12] (Polish adaptation by Kossakowska), used to assess the sense of happiness and mental well-being. It contains 23 questions, the answers to which are coded on a ten-point scale (0 – never, 10 – always). The tool consists of nine subscales: positive emotions, engagement, relationships, meaning, achievements, negative emotions, health, loneliness, happiness. The overall score is between 0-10. The higher the score, the higher the mental well-being.
3. The HADS-M scale by Zigmond and Snaith, with the Polish version developed by Majkowicz, de Walden-Gałuszko and Chojnacka-Szawłowska [13], used to measure anxiety, depression and aggression. This scale contains 16 statements and uses a four-point scale to determine the intensity of a given behavior,

thoughts, feelings or reactions. Answers are given from 0 to 3 points. For the anxiety and depression scale, a score between 0-7 is considered normal, 8-10 means the borderline of anxiety/depression, and a score of 11 or more indicates clinical cases.

Permission was obtained to use all these tools in the study and the Ethics Committee consented to the research.

Results

The IBM SPSS Statistics 25.0 statistical package was used to analyze the obtained data. The normality of the distribution of the analyzed variables was checked using the Shapiro-Wilk test. To determine the differences between the groups, the Kruskal-Wallis H test was used; for variables with normal distributions meeting the condition of equinumerosity of groups, the Student's t -test for independent samples was used, and in the absence of normality of distribution – the Mann-Whitney U test. When determining the relationships between variables, the Pearson's correlation coefficient (r) analysis was used for quantitative variables with a normal distribution. For variables without a normal distribution measured on the ordinal scale, the non-parametric Spearman's rank correlation coefficient (ρ) was used.

Mental health of patients suffering from connective tissue diseases

The average results of the intensity of symptoms of anxiety, depression (negative concept) and particular dimensions of mental well-being (positive concept) are presented in Table 2.

Table 2. Average results of the studied group in various mental health indicators

	Variable	Women (N = 81)		Men (N = 20)		Total (N = 101)	
		M	SD	M	SD	M	SD
HADS-M scale	Anxiety	10.42	4.32	9.55	4.05	10.25	4.26
	Depression	7.18	4.28	6.10	3.61	6.96	4.16
	Aggression	3.99	1.77	4.00	1.56	3.99	1.72
The PERMA-Profilier questionnaire	Positive emotions	5.56	1.75	5.37	1.48	5.52	1.69
	Engagement	5.64	1.74	5.82	1.55	5.67	1.70
	Relationships	6.28	1.83	6.57	1.52	6.34	1.77
	Meaning	5.40	2.04	5.47	1.80	5.42	1.98
	Achievements	5.53	1.64	6.07	1.43	5.63	1.61
	Negative emotions	5.84	1.77	5.03	1.53	5.68	1.75

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The PERMA-Profler questionnaire	Health		3.63	1.55	3.48	1.69		3.60	1.57
	Loneliness		4.84	2.42	4.35	1.95		4.74	2.34
	Happiness		5.62	2.26	5.65	1.90		5.62	2.18
	General mental well-being		5.67	1.60	5.82	1.41		5.70	1.56

The obtained results of the HADS-M scale indicate the presence of clinical symptoms of anxiety disorders and the borderline of depressive disorders. In turn, the analysis of mental well-being indicates interpersonal relations at the highest level, and health – at the lowest.

Relationships between mental health and selected clinical variables

Mental health of patients suffering from connective tissue diseases taking into account the type of disease

Statistical analysis was conducted consisting in checking the average results obtained in particular indicators of mental health, both in negative and positive terms, taking into account the type of disease. Four of the most numerous groups were considered, i.e., people declaring suffering from rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), juvenile idiopathic arthritis (JIA) and ankylosing spondylitis (AS). An analysis with the Kruskal-Wallis H test showed statistically significant differences in the level of sense of meaning in life for the studied groups. It was also demonstrated that there were statistical differences in the level of anxiety, general mental well-being, engagement and happiness. Detailed results are presented in Table 3.

Table 3. Average results in mental health indicators broken down by the type of declared disease

	Variable	RA (N = 34)			SLE (N = 18)			JIA (N = 11)			AS (N = 17)			Kruskal-Wallis H test results
		M	SD	Me	M	SD	Me	M	SD	Me	M	SD	Me	
HADS-M scale	Anxiety	9.62	4.95	10.00	9.39	4.15	9.50	13.00	2.86	12.00	10.24	3.33	9.00	$H(3) = 7.368$; $p < 0.061$
	Depression	6.59	4.49	6.00	6.06	3.83	5.50	8.45	4.30	8.00	7.00	4.49	7.00	$H(3) = 1.878$; n.s.
	Aggression	3.91	1.80	4.00	3.78	2.05	4.00	4.91	0.94	5.00	3.59	1.66	4.00	$H(3) = 3.993$; n.s.

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The PERMA-Profilier scale	Positive emotions	5.67	1.96	6.00	5.69	1.79	6.00	4.39	1.36	4.33	5.63	1.24	5.67	H(3) = 6.178; n.s.
	Engagement	5.80	1.86	5.83	6.20	1.65	6.17	4.48	1.31	5.00	5.63	1.52	5.33	H(3) = 7.192; $p < 0.066$
	Relationships	6.44	1.83	6.67	6.83	1.89	7.17	6.64	1.53	6.67	6.25	1.78	7.00	H(3) = 0.979; n.s.
	Meaning	5.83	2.13	6.00	5.85	1.87	5.83	4.00	1.69	4.00	5.31	1.73	5.33	H(3) = 8.124; $p < 0.05$
	Achievements	5.75	1.65	5.33	5.96	1.55	6.00	4.76	1.49	4.67	5.69	1.51	6.00	H(3) = 4.351 n.s.
	Negative emotions	5.58	1.91	6.00	5.89	1.67	5.67	6.64	1.48	6.33	5.25	1.44	5.33	H(3) = 4.530; n.s.
	Health	3.63	1.80	3.33	3.78	1.40	4.00	2.67	1.53	2.67	3.69	1.27	3.00	H(3) = 4.299; n.s.
	Loneliness	4.50	2.46	4.00	5.06	2.13	5.00	5.45	2.38	5.00	4.82	2.10	4.00	H(3) = 1.406; n.s.
	Happiness	5.65	2.60	6.00	6.17	1.95	6.50	4.27	2.10	5.00	6.00	1.62	6.00	H(3) = 6.910; $p < 0.075$
	General mental well-being	5.86	1.81	6.10	6.12	1.54	6.13	4.76	1.31	4.94	5.75	1.41	5.94	H(3) = 6.601; $p < 0.086$

n.s. – statistically nonsignificant result

In order to test the differences in the above-mentioned areas, a comparison of average results was performed using the Mann-Whitney U test. In the examined groups, it is the patients with juvenile idiopathic arthritis that are characterized by worse mental health:

- Compared to those with rheumatoid arthritis (RA), they have a significantly higher level of anxiety, $U = 107.00$; $p < 0.05$, less sense of meaning in life, $U = 91.00$; $p < 0.05$, they are less engaged, $U = 104.00$; $p < 0.05$, and experience less sense of happiness, $U = 112.5$; $p < 0.05$.
- Compared to people with systemic lupus erythematosus, they have a higher level of anxiety, $U = 40.50$; $p < 0.01$, lower sense of meaning, $U = 43.00$; $p < 0.05$, lower engagement, $U = 38.00$; $p < 0.01$, lower sense of happiness, $U = 44.00$; $p < 0.05$, and a lower level of general mental well-being, $U = 38.50$; $p < 0.05$.
- Compared to people with AS, they feel more anxiety, $U = 43.00$; $p < 0.05$, and also have a lower level of happiness, $U = 41.00$; $p < 0.05$ and of general mental well-being, $U = 50.00$; $p < 0.05$.

Relationship between mental health and the duration of disease

No relationship was observed between the duration of disease and the level of anxiety and depression, as well as general mental well-being. However, a weak positive correlation was determined between the duration of disease and health, $r_s = 0.270$; $p < 0.01$, which means that longer disease duration is associated with a better sense of health in the study group.

Mental health, symptoms of the connective tissue diseases and pain perception

The study analyzed the relationship between mental health and symptoms of the connective tissue diseases. There is a moderate positive relationship between the pain experienced in the disease and depression, $r_s = 0.321$; $p < 0.001$, and a weak positive relationship with the anxiety level, $r_s = 0.266$; $p < 0.01$. Higher levels of pain are associated with higher levels of anxiety and depression. Detailed results are presented in Table 4.

Table 4. Relationships between disease symptoms, pain perception and mental well-being indicators

Variable	Spearman's ρ correlation coefficient					
	Women (N = 81)		Men (N = 20)		Total (N = 101)	
	Disease symptoms	Pain	Disease symptoms	Pain	Disease symptoms	Pain
Positive emotions	-0.083	-0.193	-0.190	-0.361	-0.104	-0.242*
Engagement	-0.132	-0.259*	-0.219	-0.449*	-0.150	-0.284**
Relationships	-0.018	-0.237*	-0.573**	-0.158	-0.082	-0.226*
Meaning	-0.059	-0.205	-0.451*	-0.358	-0.123	-0.238*
Achievements	-0.264*	-0.337**	-0.418	-0.477*	-0.292**	-0.340**
Negative emotions	0.056	0.125	-0.020	0.620**	0.049	0.180
Health	-0.265*	-0.393**	-0.153	-0.371	-0.223*	-0.412**
Loneliness	-0.146	0.133	0.518*	0.329	-0.063	0.168
Happiness	-0.034	-0.229*	-0.370	-0.192	-0.081	-0.240*
General mental well-being	-0.122	-0.278*	-0.340	-0.360	-0.161	-0.297**
** Significant correlation at the 0.01 level (2-tailed).						
* Significant correlation at the 0.05 level (2-tailed).						

As the intensity of pain increases, the sense of general mental well-being decreases. In addition, the intensification of disease symptoms in the group of men surveyed is associated with rating interpersonal relationships lower, less sense of meaning, and

greater loneliness. In turn, stronger pain is associated with less engagement, a lower sense of achievement and greater intensity of negative emotions.

Relationships between mental health and selected sociodemographic variables

Mental health of patients suffering from connective tissue diseases taking into account the type of survey (online or on-site)

People participating in the on-site survey, compared to those surveyed online, declare a lower level of depression and greater mental well-being. In addition, they are more engaged, rate their achievements higher, and experience fewer negative emotions, but they rate their health lower. The results are presented in Table 5.

Table 5. Average results in mental health indicators broken down by the type of survey

	Variable	Online survey				On-site survey				Test results
		N	M	SD	Me	N	M	SD	Me	
HADS-M scale	Anxiety	62	10.69	4.61	11.00	39	9.54	3.58	10.00	U = 985.00; n.s.
	Depression	62	7.76	4.31	7.00	38	5.66	3.57	6.00	U = 833.50; $p < 0.05$
	Aggression	62	4.11	1.76	4.00	39	3.79	1.67	4.00	U = 1065.00; n.s.
The PERMA-Profilier questionnaire	Positive emotions	62	5.27	1.76	5.33	39	5.92	1.51	6.00	U = 961.00; $p < 0.083$
	Engagement	62	5.33	1.76	5.33	39	6.22	1.46	6.00	U = 848.00; $p < 0.05$
	Relationships	62	6.20	1.81	6.67	39	6.56	1.71	7.00	U = 1055.00; n.s.
	Meaning	62	5.16	2.09	5.33	39	5.83	1.74	5.67	U = 955.00; $p < 0.076$
	Achievements	62	5.36	1.81	5.00	39	6.07	1.10	6.00	U = 906.00; $p < 0.034$
	Negative emotions	62	5.92	1.80	6.00	39	5.29	1.60	5.33	U = 943.00; $p < 0.063$
	Health	62	3.35	1.58	3.17	39	3.99	1.49	4.00	U = 886.00; $p < 0.05$
	Loneliness	62	4.81	2.53	5.00	39	4.64	2.02	4.00	U = 1154.00; n.s.
	Happiness	62	5.27	2.33	6.00	39	6.18	1.82	6.00	U = 963.50; $p < 0.082$
	General mental well-being	62	5.43	1.68	5.42	39	6.13	1.26	6.00	U = 916.00; $p < 0.05$

n.s. – statistically nonsignificant result

*Mental health of patients suffering from connective tissue diseases
taking into account age*

The only relationship observed was that between age and some components of mental well-being. The older people are, the higher they rate positive emotions they experience, as well as the meaning of life, health and happiness; at the same time, they experience fewer negative emotions. Detailed analyses are presented in Table 6.

Table 6. **Age and the mental health of patients suffering from connective tissue diseases**

	Correlation coefficient
Variable	Age
Anxiety	$r = -0.161$; n.s.
Depression	$r_s = -0.079$; n.s.
Aggression	$r_s = -0.142$; n.s.
Positive emotions	$r = 0.258$; $p < 0.01$
Engagement	$r = 0.121$; n.s.
Relationships	$r_s = -0.112$; n.s.
Meaning	$r = 0.214$; $p < 0.05$
Achievements	$r = 0.069$; n.s.
Negative emotions	$r = -0.202$; $p < 0.05$
Health	$r_s = 0.343$; $p < 0.001$
Loneliness	$r_s = -0.021$; n.s.
Happiness	$r_s = 0.226$; $p < 0.05$
General mental well-being	$r = 0.150$; n.s.

n.s. – statistically nonsignificant result

*Mental health of patients suffering from connective tissue diseases
taking into account gender*

Gender does not differentiate the examined patients in terms of mental health. In the studied group, women were characterized by a higher level of anxiety and depression than men, but these were not statistically significant differences (anxiety: $U = 735.50$; n.s.; depressiveness: $U = 687.50$; n.s.). Similarly, no differences in the level of well-being were observed ($U = 790.00$; n.s.) between sick men and women.

*Mental health of patients suffering from connective tissue diseases
taking into account education*

Subjects with lower education were characterized by a significantly higher level of anxiety ($t(99) = 2.184$; $p < 0.05$) and depression ($U = 942.00$; $p < 0.05$) compared

to patients with university education. It was also found that the intensity of positive emotions in people with higher education is statistically significantly higher than in the group of people with lower education $t(99) = 2.320$; $p < 0.05$; $d = 0.46$. People with higher education are characterized by a higher (on the level of statistical significance) sense of meaning $t(99) = 1.762$; $p < 0.081$; $d = 0.35$, as well as general mental well-being $t(99) = -1.878$; $p < 0.063$; $d = 0.37$. Detailed results are presented in Table 7.

Table 7. Average results of mental health indicators for different levels of education

Variable	Higher education (N = 52)			Primary and secondary education (N = 49)			Test results
	M	SD	Me	M	SD	Me	
Anxiety	9.37	4.33	9.00	11.18	4.02	11.00	$t(99) = 2.184$; $p < 0.05$; $d = 0.43$
Depression	6.06	4.07	6.00	7.94	4.07	7.50	$U = 942.00$; $p < 0.05$
Aggression	3.77	1.74	4.00	4.23	1.69	4.00	$U = 1071.50$; n.s.
Positive emotions	5.89	1.61	6.00	5.13	1.71	5.00	$t(99) = -2.320$; $p < 0.05$; $d = 0.46$
Engagement	5.89	1.79	5.83	5.44	1.58	5.33	$t(99) = 1.331$; n.s.
Relationships	6.58	1.72	6.67	6.08	1.80	6.67	$U = 1075.00$; n.s.
Meaning	5.75	1.93	5.50	5.06	1.99	5.33	$t(99) = -1.762$; $p < 0.081$; $d = 0.35$
Achievements	5.85	1.69	6.00	5.41	1.49	5.33	$t(99) = -1.375$; n.s.
Negative emotions	5.72	1.73	6.00	5.63	1.78	5.67	$t(99) = -0.263$; n.s.
Health	3.78	1.71	4.00	3.41	1.40	3.00	$U = 1100.50$; n.s.
Loneliness	4.64	2.26	4.50	4.86	2.43	4.00	$U = 1205.00$; n.s.
Happiness	5.92	2.16	6.00	5.31	2.18	6.00	$U = 1065.50$; n.s.
General mental well-being	5.98	1.58	6.00	5.41	1.50	5.33	$t(99) = -1.878$; $p < 0.063$; $d = 0.37$

t – Student's t-test

d – effect size, Cohen's d

U – Mann-Whitney U test

n.s. – statistically nonsignificant result

*Mental health of patients suffering from connective tissue diseases
taking into account work status*

The level of depression is significantly higher in the group of persons not working / unable to work. Economically active people are more engaged, rate their interpersonal

relationships higher, experience a greater sense of meaning of life, and also rate their achievements and sense of health higher. Detailed results are presented in Table 8.

Table 8. Average results of mental health indicators broken down by work status

Variable	Economically inactive (N = 16)			Working / studying (N = 85)			Test results
	M	SD	Me	M	SD	Me	
Anxiety	11.00	4.79	12.50	10.11	4.17	10.00	U = 571.00; n.s.
Depression	9.38	4.69	10.00	6.50	3.91	6.50	U = 420.50; $p < 0.05$
Aggression	4.38	1.96	5.00	3.92	1.68	4.00	U = 547.50; n.s.
Positive emotions	4.92	1.22	4.17	5.64	1.66	5.67	U = 496.00; $p < 0.086$
Engagement	4.69	1.72	4.50	5.86	1.64	5.67	U = 424.00; $p < 0.05$
Relationships	5.38	1.62	5.50	6.52	1.75	6.67	U = 412.50; $p < 0.05$
Meaning	4.63	2.12	4.67	5.57	1.93	5.67	U = 462.50; $p < 0.05$
Achievements	4.50	2.12	3.83	5.85	1.41	6.00	U = 380.50; $p < 0.01$
Negative emotions	5.67	2.24	6.17	5.68	1.65	5.67	U = 618.00; n.s.
Health	2.90	1.40	2.67	3.73	1.57	4.00	U = 464.00; $p < 0.05$
Loneliness	5.56	2.88	7.00	4.59	2.21	4.00	U = 507.00; n.s.
Happiness	5.25	2.27	5.00	5.69	2.17	6.00	U = 600.50; n.s.
General mental well-being	4.89	1.65	4.69	5.85	1.51	5.94	U = 441.50; $p < 0.05$

n.s. – statistically nonsignificant result

Mental health of patients suffering from connective tissue diseases taking into account place of residence

Respondents living in the countryside are characterized by the highest levels of anxiety, depression, negative emotions and loneliness, and also rated the interpersonal relationships the lowest among all the studied groups. In order to determine the differences between groups, the Mann-Whitney *U* test was performed. Due to small differences in the scale determining the place of residence, the analysis was carried out for three groups: people living in the countryside, in a small town and in a large city. Detailed data are presented in Table 9.

Table 9. Average results of mental health indicators broken down by place of residence

Variable	The countryside			Town with a population under 50,000 (N = 14)			Town with a population of 50-100,000 (N = 16)			City with a population of 100-250,000 (N = 18)			City with a population over 250,000 (N = 36)			
	N	M	SD	Me	M	SD	Me	M	SD	Me	M	SD	Me	M	SD	Me
Anxiety	17	12.24	4.24	12.00	10.93	3.25	11.00	9.44	3.22	9.50	11.22	4.01	12.00	8.92	4.77	10.00
Depression	16	9.38	4.50	9.00	7.86	4.13	7.00	5.69	3.40	6.00	8.00	3.43	7.00	5.58	4.12	7.00
Aggression	17	4.53	1.55	4.00	3.93	1.69	4.00	3.75	1.29	4.00	4.61	1.61	5.00	3.56	1.95	4.00
Positive emotions	17	5.06	1.73	4.33	5.17	1.57	5.33	5.98	1.62	6.17	5.39	1.33	5.50	5.75	1.90	5.67
Engagement	17	5.37	1.81	5.33	4.98	1.61	5.17	6.02	1.20	6.17	5.81	1.61	6.33	5.86	1.89	5.67
Relationships	17	5.14	1.65	4.67	5.24	1.54	5.17	6.81	1.90	7.17	6.59	1.47	6.67	7.00	1.57	6.67
Meaning	17	4.71	2.44	5.00	4.90	1.72	5.33	5.79	1.54	5.67	5.28	1.86	5.50	5.85	2.02	5.33
Achievements	17	5.33	1.59	5.00	5.48	1.47	5.17	5.77	1.50	6.17	5.17	1.69	5.50	6.01	1.66	5.67
Negative emotions	17	6.39	1.98	7.00	5.95	1.56	5.83	4.85	1.56	4.83	6.17	1.35	6.00	5.36	1.80	5.67
Health	17	3.86	1.60	3.67	4.12	1.69	4.67	3.40	1.39	3.50	3.56	1.45	3.67	3.38	1.66	3.67
Loneliness	17	6.29	2.37	7.00	4.36	1.34	5.00	4.50	2.03	4.00	4.50	2.66	4.50	4.39	2.39	4.00
Happiness	17	5.00	2.65	5.00	4.79	2.08	5.00	6.25	2.02	7.00	5.72	1.60	6.00	5.92	2.25	6.00
General mental well-being	17	5.10	1.71	4.89	5.09	1.40	5.22	6.10	1.30	5.94	5.66	1.25	5.94	6.06	1.70	5.89

The analysis demonstrated that sick people living in the countryside are characterized by a higher level of loneliness than people living in a town of up to 50,000 residents: $U = 62.00; p < 0.05$. These people, compared to people living in a big city, also feel stronger anxiety: $U = 182.50; p < 0.05$, have more symptoms of depression: $U = 148.50; p < 0.01$, and also have a lower level of general mental well-being: $U = 214.00; p < 0.08$. Moreover, they rate their interpersonal relationships lower: $U = 137.00; p < 0.001$, experience more negative emotions: $U = 209.50; p < 0.065$, and are also lonelier than people living in a city of more than 250,000 residents: $U = 171.50; p < 0.01$.

Discussion of the results

The World Health Organization [14] defines health as complete well-being in the mental, physical and social spheres of man. Therefore, every element of health is important and imbalance in any of its areas can affect other dimensions of health. An example would be chronic somatic diseases, including connective tissue diseases (rheumatic diseases, collagen diseases), which may be associated with, among others, the mental health of a person suffering from them. The conducted research was aimed at assessing mental health in negative terms, i.e., the presence of psychopathological indicators, as well as in positive terms – mental well-being of patients with selected connective tissue diseases, taking into account some clinical and sociodemographic variables.

In the context of negative mental health, the subjects are characterized by an increased level of anxiety and depression. The obtained data are in line with previous studies [3, 15]. The severity of anxiety among the examined patients indicates the occurrence of clinical symptoms of anxiety disorders, and the results on the depression scale may suggest the borderline of depressive disorders.

It is worth noting, however, that anxiety and depression disorders are multifactorial. In the course of inflammatory diseases, comorbidity with depression is observed. Therefore, anxiety and depression in the studied subjects may also be the result of a progressing inflammatory process. According to the inflammatory theory of depression, in such disorders, activation of the immune system and the occurrence of an inflammatory process in the central and peripheral nervous system are observed. The increase in proinflammatory cytokines is associated with the appearance of characteristic symptoms of depression, including depressed mood, anxiety and irritability. Inflammatory cytokines are factors that affect the functioning of the serotonergic system and the hypothalamic–pituitary–adrenal axis, whose activity is important in the course of depression. They also participate in communication between the immune system, neurotransmitters and the endocrine system [16, 17]. Traditional anti-rheumatic drugs affect the relationship between inflammation and depression in people with rheumatoid arthritis [18]. In addition, glucocorticoids used in patients with connective tissue diseases may cause side effects in the form of psychopathological symptoms [19].

In the study group, it was observed that people who had been suffering from the disease for a longer period of time rated their mental health better, which is interesting and contradicts the data from literature [20]. It is possible that this situation may be related to adaptation to the disease and the ability to deal with problems resulting from the experienced ailments. The study included people with various diagnoses, including juvenile idiopathic arthritis, systemic lupus erythematosus and ankylosing spondylitis. Although all these diseases belong to the group of rheumatic diseases, the specificity of each of them is different, and the sense of health may be affected by various fac-

tors resulting from the course of the disease. It may be also significant that the study involved mainly people in early and middle adulthood, mostly well-functioning despite their chronic illness, and associated with an organization that offers a wide range of support in coping with the disease.

The group of factors that may be related to the deterioration of mental health includes severe pain caused by the disease [21]. It appears that 50% of patients experiencing chronic pain suffer from comorbid depressive disorders [22]. The current research also confirmed that severe pain is associated with higher levels of depression and anxiety. It is worth noting that the very course of rheumatic diseases is unpredictable, and the lack of an effective way to reduce pain may further deepen the sense of lack of control over one's health and treatment. As research results suggest, people who feel they have a sense of control over their lives are less vulnerable to the occurrence of emotional disorders [23]. It can therefore be assumed that a similar relationship also exists in the examined group, and this could explain the comorbidity of severe pain and difficulties in the area of mental health. Anxiety and depression disorders can be associated with the difficult course of the disease and the physical and emotional costs incurred. Moreover, experiencing severe stress, unpredictability of the disease, progressive limitation of activity, and a sense of being disabled may have a negative impact on the mental health of people with this diagnosis [24].

It was emphasized several times in this work that mental health is more than just the absence of diseases or mental disorders; hence, it is worth drawing attention to the extent to which ill people are satisfied with their lives. Mental well-being, which is one of the indicators of life satisfaction, also deteriorates in the course of disease [20]. The analysis of the state of mental health of the respondents in this aspect shows that they rate their interpersonal relations the highest, and health the lowest. However, no relationship was found between the severity of disease symptoms and the general level of mental well-being in the entire study group. It was observed, however, that stronger pain is associated with lower levels of mental well-being, which includes a lower rating of achievements and sense of health. This may indicate that people experiencing severe pain are forced to limit social and economic activity, and this prevents them from achieving their goals.

The age of the examined patients turned out to be significant only in the aspect of well-being. The older the patient, the more positive emotions they experience, and the better they assess the sense of life, their own health and happiness. They also feel negative emotions less often.

Interesting results were obtained in the group of studied men. Namely, men who experienced more severe ailments related to the disease rated their interpersonal relations lower, were lonelier and had less sense of meaning in life, and experiencing strong pain was associated with less engagement and a greater intensity of negative emotions. It is possible that due to illness men may perceive themselves as defective,

give up social activity and less often participate in social gatherings, which translates into the difficulties they report. Rheumatic diseases often limit everyday functioning, including the possibility of engaging in socio-economic activity [25].

The level of education turned out to be equally important. Subjects with higher education are characterized by better mental health, i.e., they experience greater mental well-being, more positive emotions and have a greater sense of meaning in life, as well as experience less anxiety and report fewer depressive symptoms. The study also showed that depressive disorders occur in the group of subjects with lower education. It should be borne in mind that these people have worse health than people with higher education, and this may be associated with poorer mental health [26]. However, it is worth drawing attention to the fact that people with higher education suffering from rheumatoid arthritis rate their physical sphere higher [20], and a low level of knowledge and education is associated with worse self-care in the disease [27].

Unemployment is associated with a deterioration in the quality of life and health. This situation particularly concerns young people [26]. The obtained results confirmed that professionally active people are characterized by a higher level of mental well-being, and in particular they are more engaged, rate their interpersonal relationships higher, have a greater sense of meaning in life, and also rate their achievements and sense of health higher. It turned out that economically inactive people are characterized by greater depressiveness. Clinical symptoms of depressive disorders were also found in this group. This area of patients' lives seems to be particularly important because professional activity in the group of patients is related to their socialization [28]. Lack of work is associated not only with lower mental well-being but also with lower self-esteem, social isolation, and finally, depression [29, 30]. People suffering from rheumatic diseases feel marginalized on the labor market, and also feel anxiety and the fear of having to change or quit their job because of the worsening symptoms [25]. This situation can also take place in the case of the examined group, which translates into the experienced psychological difficulties.

In the current research, the respondents differed in the level of mental health in the context of the place of residence and the way of conducting the study. The residents of small towns and the countryside are characterized by worse mental health. It may be related to the availability of support, both from specialists and the broadly understood social network, e.g., of patients, or a professional network. This may probably be related to the fact that those completing the surveys on-site were characterized by better mental health compared to those surveyed online. Respondents surveyed on-site completed the questionnaires during one of the meetings of the Association whose goal is, among others, providing emotional support and education. Associations and support groups very often function in larger cities.

Conclusions

Analyzing the obtained data and trying to formulate conclusions, we must remember that the respondents declared the diagnosis of the disease and on this basis, they were included in the group. Declared diagnoses were not verified by the medical doctor. The conclusions, taking into account this fact, are as follows:

1. The examined persons declaring suffering from connective tissue diseases are characterized by a high level of anxiety, which indicates the occurrence of clinical symptoms of anxiety disorders in the studied group. The level of depression in the respondents indicates the borderline of depressive disorders.
2. People who have been ill for a longer time rate their health better (one of the dimensions of well-being).
3. People who suffer from stronger pain experience stronger anxiety, report more symptoms of depression, and also have a feeling of lower mental well-being.
4. With age, the level of satisfaction, sense of life, subjective feeling of health and positive emotions increases, while the level of negative emotions decreases.
5. The studied persons with higher education and economically active persons are characterized by a higher level of mental well-being.
6. The respondents living in the countryside and smaller towns are characterized by worse mental health.
7. The respondents completing the survey online are characterized by worse mental health.
8. Due to the nature of connective tissue diseases, it is important to monitor the mental health of patients, both in the sense of controlling the indicators of mental health disorders (negative concept) and analyzing well-being (positive concept).
9. Particular attention should be paid to patients in the initial stage of the disease, suffering from severe pain and experiencing limitations related to the effects of the underlying disease, young people with lower education, economically inactive persons and those with worse access to sources of support, e.g., residents of smaller towns.

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