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ASSESSMENT OF COMORBID PROFILE, QUALITY OF LIFE AND SOCIAL FUNCTIONING IN PATIENTS WITH SCHIZOPHRENIA AND SCHIZOTYPAL DISORDERS

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Ключові слова: *шизофренія, шизотипові розлади, коморбідний профіль, якість життя, соціальне функціонування*

Abstract. *Assessment of comorbid profile, quality of life and social functioning in patients with schizophrenia and schizotypal disorders. Romash I.R. One of the most common mental illnesses is schizophrenia and schizotypal disorders. According to the literature data, mortality among patients with schizophrenia is 1.5-2 times higher than among*

the general population. Patients with schizophrenia have a higher prevalence of cardiovascular disease, obesity, diabetes, osteoporosis in comparison with the general population. Such comorbid somatic diseases in the case of schizophrenia have a more acute course, a significant impact on the course of the underlying disease, the development of complications, decrease in quality of life and social functioning. The aim of the study was to study the presence and features of comorbidity, its impact on the quality of life and social functioning of patients with schizophrenia and schizotypal disorders. 100 patients were included in the study. They were divided into two groups: experimental (Group I) with schizophrenia and comparison (Group II), with other schizophrenic diseases, such as schizoaffective and schizotypal disorder. All patients were scaled according to the following methods: The Cumulative Illness Rating Scale (CIRS), Clinical Global Impression – Severity Scale (CGI-S), The Personal Social Performance Scale (PSP), CGI-S, and a short form of the questionnaire Medical Outcomes Study 36-Item Short-Form Health Status (SF-36). Charlson Index was also calculated for all patients included in the study. Due to CIRS, we detected undiagnosed comorbidity that aggravated the course of the underlying disease: 38% in Group I and 26% in Group II. The most common components in the structure of comorbidity in the patients with schizophrenia were diabetes mellitus, musculoskeletal diseases, cardiovascular diseases, non-alcoholic fatty liver disease (NAFLD). Patients with schizotypal disorders were more often diagnosed with peripheral vascular diseases, chronic lung diseases, chronic kidney diseases, and upper gastrointestinal tract disorders. A comprehensive approach to be important in the treatment of such patients. The nature and extent of comorbidity should be definitely taken into account. This will promote the compliance and improve the indicators in the examined category of patients.

Реферат. Оцінка коморбідного профілю, якості життя та соціального функціонування у хворих на шизофренію та шизотипові розлади. Ромаш І.Р. Порівняно із загальною популяцією хворі на шизофренію та шизотипові розлади мають більшу високу поширеність коморбідних соматичних захворювань, яким характерний гостріший перебіг, значний вплив на основне захворювання, розвиток ускладнень, зниження якості життя та соціального функціонування. Метою дослідження було вивчити наявність та особливості коморбідності, її вплив на якість життя та соціальне функціонування хворих на шизофренію та шизотипові розлади. До дослідження було включено 100 пацієнтів. Вони були розподілені на дві групи: експериментальну (група I) із шизофренією та групу порівняння (група II) із шизотиповими розладами. Усі пацієнти були оцінені відповідно до таких методик: «Кумулятивна шкала рейтингу захворювань» – The Cumulative Illness Rating Scale (CIRS), "Шкала загального клінічного ураження - тяжкості захворювання" – Clinical global impression – Severity scale (CGI-S), "Шкала повсякденного та соціального функціонування" – The Personal Social Performance scale (PSP) та короткої форми опитувальника Medical Outcomes Study 36-Item. Також усім включеним у дослідження пацієнтам проводили розрахунок індексу Чарлсона (Charlson Index). Завдяки системі CIRS нами була виявлена раніше не діагностована супутня патологія, що обтяжує перебіг основного захворювання: 38% у I групі та 26% у II групі. Найбільш частими компонентами в структурі коморбідності у хворих на шизофренію були цукровий діабет, захворювання опорно-рухового апарату, серцево-судинні захворювання, неалкогольна жирова хвороба печінки (НАЖХП). У хворих із шизотиповими розладами найчастіше діагностували захворювання периферичних судин, хронічні захворювання легень, хронічні захворювання нирок, захворювання верхніх відділів шлунково-кишкового тракту. У лікуванні таких хворих важливим є комплексний підхід. Необхідно обов'язково враховувати характер та ступінь супутніх захворювань. Це сприятиме зростанню комплаєнтності та поліпшенню показників в обстежуваній категорії хворих.

Modern requirements for the development of medical science and practice primarily relate to the specialists' solution of new problems. Currently, not only the problems of effective treatment of specific mental illnesses are prioritized, but also early diagnosis and quality correction of comorbid conditions. Comorbidities are important since they affect the diagnostic process, therapeutic approach, treatment effect and overall result for the patient.

A characteristic feature of the modern medical and diagnostic process is a combination of several pathological conditions in a patient. According to the statistical data, about 7% of the world adult population have 3 or more chronic diseases. Along with this, the figure increases by 1.5-2 times among patients with mental illness.

In 2019 mental disorders made up 5% of the total burden of diseases [1]. The World Health Organization's Sustainable Development Goals, including

Goals 3 and 4, emphasize the importance of treating mental disorders [2]. Mental disorders are often observed as multimorbidity with somatic conditions, moreover, these two conditions are likely to exacerbate each other [3, 4, 5, 6].

One of the most common mental illnesses is schizophrenia and schizotypal disorders. Schizophrenia is known to be a severe mental illness that affects approximately 1% to 2.5% of the world's population [7]. It is important to note that schizophrenia is a serious economic problem in any country, and its share according to YLD (years lost due to a disability) reaches almost 3%. This disease belongs to the disabling ones and DW (disability weight) index indicating the level of disability caused by schizophrenia constitutes 0.576 (0.406-0.572) on average and tends to increase [8, 9]. According to the literature data, mortality among patients with schizophrenia is 1.5-2 times higher than among the

general population [10]. Regarding the life expectancy, it is, on average, 10 years shorter (by 30% according to other estimates) in patients with schizophrenia. After conducting a comprehensive analysis of scientific researches, scientists have concluded that patients with schizophrenia have a higher prevalence of cardiovascular disease, obesity, diabetes, osteoporosis in comparison with the general population [11]. Such comorbid somatic diseases in case of schizophrenia have a more acute course, a significant impact on the course of the underlying disease, the development of complications. According to the scientific data, the probability of three-year mortality progressively increases in patients with comorbidities. In particular, it reaches 82% in case of two or more diseases, and there is a decrease in quality of life and social functioning [12, 13, 14, 15].

In addition, “somatic disease is able to alter the disease pattern of schizophrenia in some way, acting as a pathoplastic factor” [16]. This confirms the importance of a more profound study of the interaction between the endogenous schizophrenic process and somatic pathology.

Additionally, according to the scientific data, patients with schizophrenia receive less adequate medical care for their somatic diseases. Modern medicine, and psychiatry in particular, is not ready to work with multimorbid patients. The main tasks are performed by general practitioners. Unfortunately, their decisions about treatment choice are often intuitive and end in polypragmasy [17].

Comorbidities in patients with mental illness are often considered a complication of antipsychotic therapy [18]. Any schizophrenia treatment is somewhat palliative due to the fact that the etiological factors and trigger mechanisms of schizophrenia still remain unclear. Therefore, considering the abovementioned data, special attention of clinicians and scientists should be drawn to the safety of therapy for this category of patients. Along with high efficiency of psychotic symptoms treatment, it is important to achieve a minimum frequency and severity of side effects in order to avoid at least additional complications and comorbidities development.

Summarizing the abovementioned information, the relevance of this research is obvious. It is caused by the urgent need to study the features of the aggravating effect of the detected comorbidity associated with schizophrenia at a new scientific and clinical level. This will provide an opportunity to develop early diagnostic criteria and increase the effectiveness of comprehensive treatment in order to improve the quality of life of the examined patients, as well as to reduce the complications incidence.

The objective of the research was to study the presence and features of comorbidity, its impact on the quality of life and social functioning of patients with schizophrenia and schizotypal disorders.

MATERIALS AND METHODS OF RESEARCH

The research was conducted at the premises of Municipal Non-profit Enterprise “Prykarpattia Regional Clinical Center for Mental Health of Ivano-Frankivsk Regional Council” (MNE PRCCMHIFRC) and “Pohonia Psychoneurological Care Home”.

In order to achieve the objective, 100 patients were included in the study with their informed consent. All the examined patients were divided into experimental and comparison groups. The experimental group (Group I) included 50 patients (28 women and 22 men) with schizophrenia. The comparison group (Group II) included 50 people (31 women and 19 men) with other schizophrenic diseases, such as schizoaffective and schizotypal disorders. For the purpose of a comprehensive examination, all patients were scaled according to the following methods: The Cumulative Illness Rating Scale (CIRS) (Linn B.S. et al., 1968) [19], Clinical Global Impression – Severity Scale (CGI-S) [20], The Personal Social Performance Scale (PSP) [12, 13, 23], and a short form of the questionnaire Medical Outcomes Study 36-Item Short-Form Health Status (SF-36) (Ware et al., 1993). Charlson Index was also calculated for all patients included in the study [14, 21].

In working with patients, we adhered to the basic principles of GMP (1996), ethical principles of scientific medical research with human participation – the Helsinki Declaration of the World Medical Association (Helsinki 1964, 2000 ed.), The Council of Europe Convention on Human Rights and biomedicine (dated 04.04.1997) The study was approved by the Committee on Bioethics of Ivano-Frankivsk National Medical University (No. 128/22, dated 15. 06. 2022).

Prior to inclusion in the study, all patients signed a voluntary informed consent.

Criteria for inclusion in the study were the following: patients’ age from 18 to 65 years; present mental disorder, namely schizophrenia, requiring inpatient treatment in the ward and 1 or more concomitant somatic diseases. Exclusion criteria were the following: drug addiction, alcohol abuse in the past medical history; neurological disorders and somatic disorders with neurological components; mental retardation or severe dementia, lack of informed consent.

Statistical processing of the obtained results was performed using «STATISTICA 8.0.» (StatSoft, Serial STA862D175437Q) and the package of statistical functions of “Microsoft Excel, 2016”. The reliability of the obtained indicators was confirmed by calculating the errors for relative values and the probability

of the difference between the data in the compared groups was proved by calculating the t coefficient (Student's coefficient) with determining accurate prediction according to the accuracy table. Arithmetic mean (M), standard error ($\pm m$) were used to describe quantitative characteristics [22].

RESULTS AND DISCUSSION

Women predominated among the examined patients, constituting 56% in Group I and 62% in Group II. The analysis of sex correlation among the examined patients is shown in Figure 1.

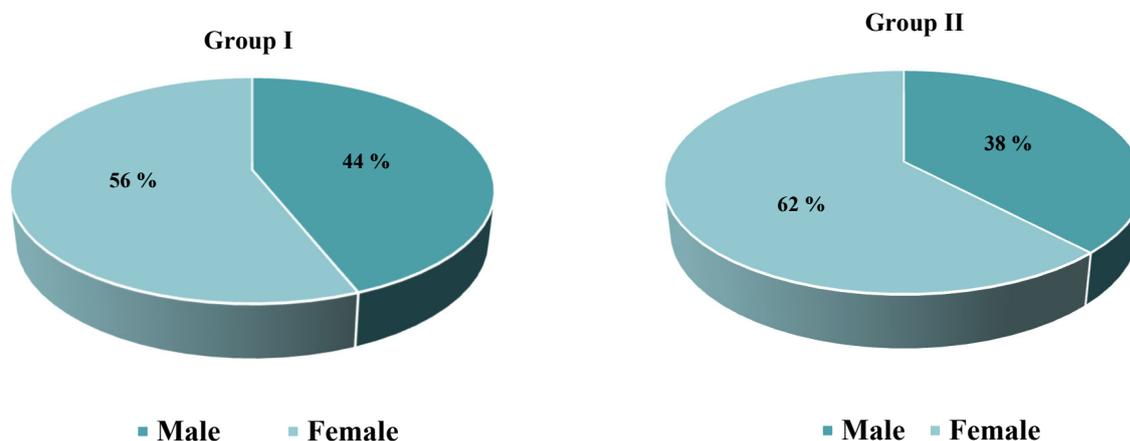


Fig. 1. Distribution of the examined patients by sex

The mean age of patients was 34.4 \pm 5.8 in Group I and 32.6 \pm 4.3 in Group II. According to the WHO criteria, such sample of patients can be described as a sample of young adult representatives. The medical history of the disease ranged from 2.5 to 20 years at the time of the patients' inclusion in the study.

The level of education received by the examined patients is presented in Table 1. According to the data presented in the table, the majority of patients in Group I received secondary specialized education (44%), while the patients in Group II

received incomplete higher education (46%). 12% of patients in Group I and 28% of patients in Group II received higher education.

Despite the sufficient level of education, most of the respondents were engaged in low-skilled, physical work. They were not able to get a job according to the received specialty, the work was seasonal, temporary. Regarding marital status, 48% of patients in Group I and 64% of patients in Group II were married. Single people constituted 38% and 22%, respectively, mainly due to the divorce.

Table 1

Distribution of patients by the level of education

The level of the received education	Group I (n=50)		Group II (n=50)	
	abs.	%	abs.	%
Secondary	6	12%	8	16%
Secondary specialized	22	44%	20	40%
Incomplete higher	16	32%	23	46%
Higher	6	12%	14	28%
Two and more higher educations	-	-	1	2%

According to the CIRS, comorbidity was diagnosed in 84% of patients in Group I and 64% of patients

in Group II. It is important to note that the number of comorbidities diagnosed in the examined patients



before the scaling according to Cumulative Illness Rating Scale was significantly lower, on an average by 38% in Group I and 26% in Group II compared to the obtained results of the conducted research. The frequency of comorbidities in the examined patients according to the CIRS is shown in Figure 2. Only 13 categories are shown in this figure for the convenience of data visualization. The fourteenth category, namely mental illness, was present in 100% of respondents as mandatory provision, since this was one of the main criteria for the patient's inclusion in the study.

According to the presented data, diseases of the endocrine system, heart, musculoskeletal system and skin, urogenital system and kidneys, gastrointestinal tract (GIT) (liver, pancreas, esophagus, stomach, duodenum, large and small intestine) significantly more often occurred in the patients of Group I. The data obtained are comparable with the results of studies by Hunt GE and co-authors, Mathers CD and co-authors [5, 7]. In particular, endocrine diseases were detected in 24% of patients in Group I, which

was twice as much as in Group II, where this figure constituted 12%. Interestingly, the proportion of cardiac diseases constituted 10% in the patients of Group I and 4% in the examined of Group II, while vascular diseases (peripheral vessels) occurred with a frequency of 2% and 14%, respectively. Musculoskeletal system and skin diseases were detected in 18% of patients in Group I and 8% of patients in Group II. Such clusters as diseases of the genito-urinary system and kidneys were observed in 14% and 12% of patients in Group I and 6% and 4% of patients in Group II. The upper gastrointestinal tract disorders were more represented in Group II than in Group I: 22% vs. 8%, respectively. Whereas, diseases of the large and small intestine occurred with a frequency of 6% in Group I and 4% in Group II. A significant proportion of comorbidities was comprised by two clusters: respiratory diseases and diseases of the ENT organs, visual organs. A significant advantage was among the patients of Group II, where their proportion constituted 24% and 18%, vs. 14% and 6% in Group I.

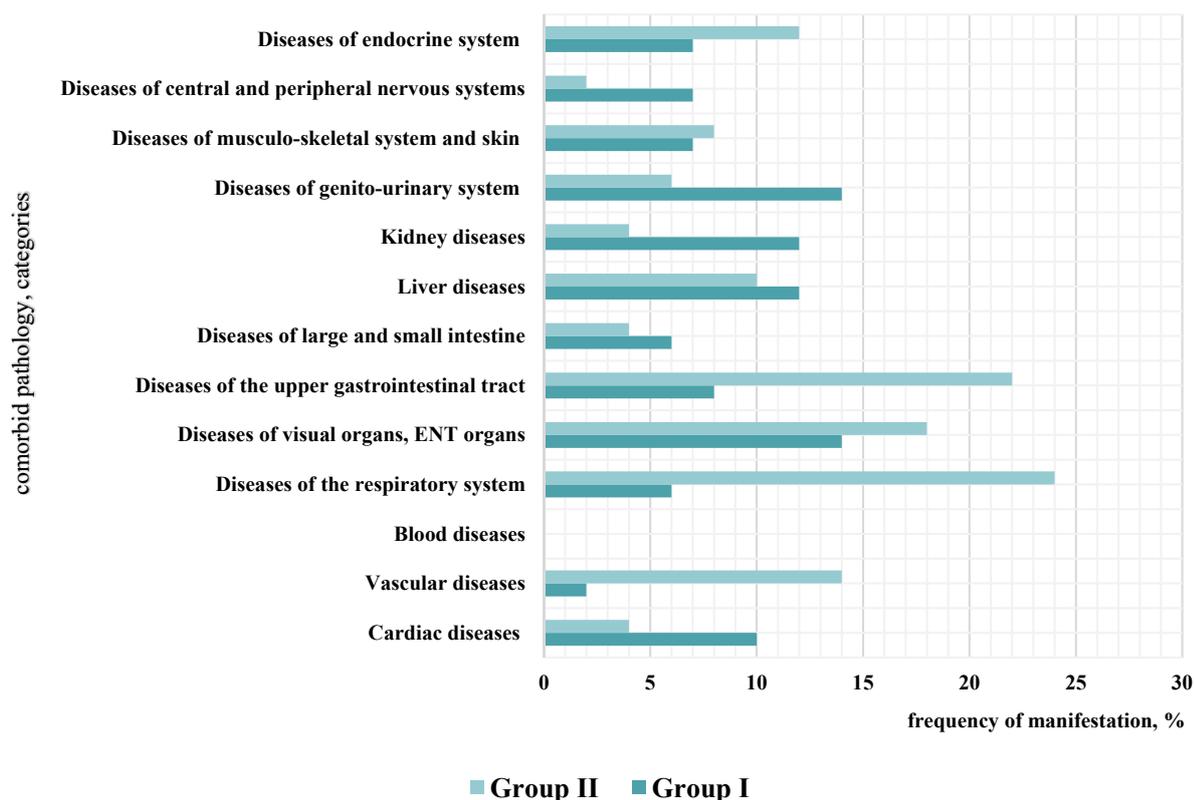


Fig. 2. Frequency of comorbidities in the examined patients according to the Cumulative Illness Rating Scale

Simultaneously, an assessment was performed according to the Charlson Comorbidity Index (Fig. 3.). On its basis, the range of comorbidities was found to be significantly higher in Group I compared

to Group II. The absolute number of comorbid somatic diseases averaged 3.53 ± 0.5 among the patients of Group I and 1.9 ± 0.5 in Group II ($p=0.02$).

Cerebrovascular diseases, diabetes mellitus, moderate liver diseases were the most common among the comorbidities of the patients in Group I. Whereas, diseases of the peripheral arteries, chronic diseases of the lungs, kidneys and gastrointestinal tract were observed in the patients with schizotypal disorders in addition to cerebrovascular diseases.

According to the data presented in Figure 3, cerebrovascular pathology ranks the first among comorbidities. A similar trend can be traced in the works of Pati S and co-authors [17]. Some disorders were detected in 30% of all respondents. Comorbid diabetes mellitus (DM) type 2 was observed in 28 examined patients. This disease occurred in

18 patients in group I. Two of the patients were diagnosed with complications of diabetes in the form of diabetic retinopathy and angiopathy. Liver disorders of varying severity were observed in 36 examined patients. Moderate or severe hepatic disorder was noted in 10 patients in Group I and in 4 patients in Group II. Mild hepatic disorder was detected in 12 patients in Group I and in 10 patients in Group II. Moderate or severe kidney disease was detected in 14 examined patients, mainly due to the patients of Group I, where the disease was found in 10 individuals. 12 examined patients had a history of peptic ulcer disease, in particular 4 patients of Group I and 8 patients of Group II.

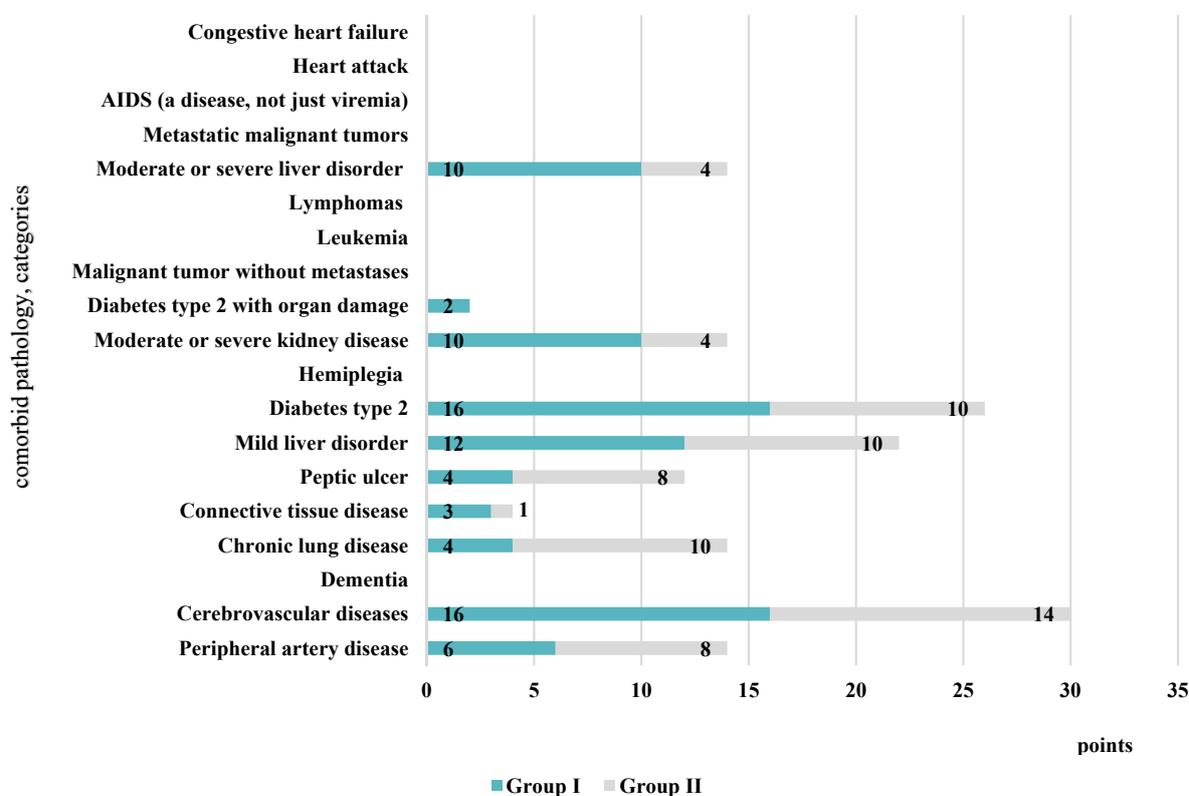


Fig. 3. The ratio of comorbidity manifestation in the examined patients according to the evaluation system of the Charlson Comorbidity Index

The value of the Charlson Comorbidity Index is shown in Figure 4. According to the presented data, it averaged 3.54 ± 0.14 in Group I while in Group II it constituted 2.96 ± 0.15 ($p=0.005$) indicating a level of 10-year survival as 77% and 90%, respectively. In addition, interquartile range (Q1-Q2) of indicators amounted to 3.0-4.0 in Group I and 2.0-3.25 in Group II (Fig. 4).

According to the CGI-S scale, the severity of mental disorders in Group I averaged 5.8 ± 0.6 points

(Table 2). This indicator demonstrated a significant deterioration in the functioning of social and professional spheres. In the works of Ishigooka J and co-authors, Burges PM and co-authors, a similar trend is also noteworthy [18, 23]. The mean indicator according to this scale constituted 4.4 ± 0.5 points in Group II showing significant mental disorders, which, apparently, had led to hospitalization.

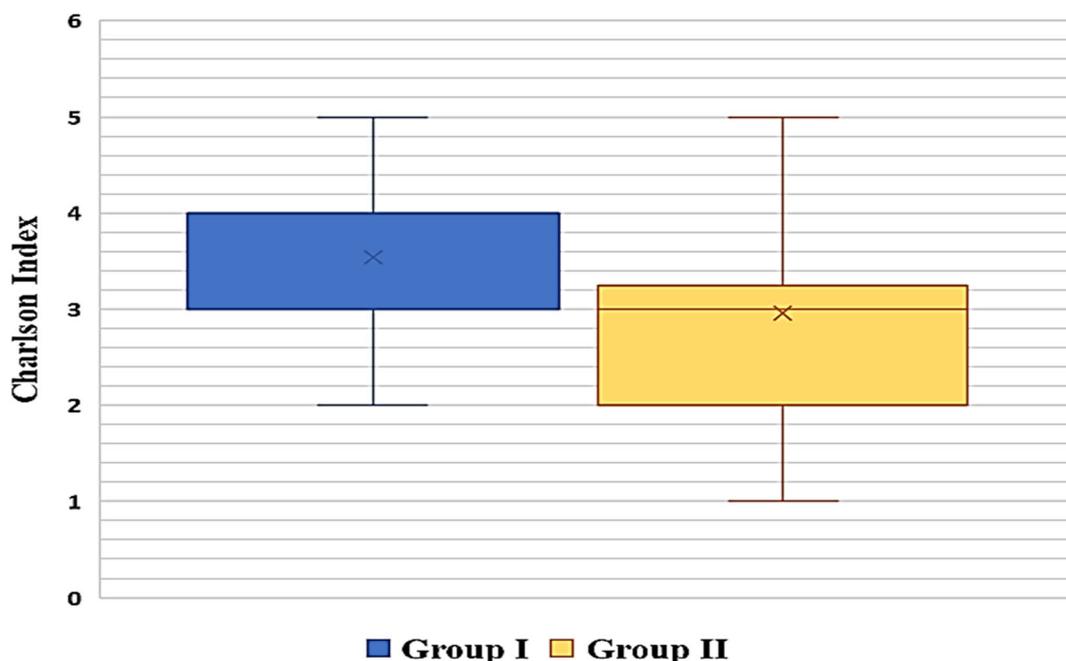


Fig. 4. Interquartile ranges of the Charlson Comorbidity Index in the examined patients

When assessing social functioning according to the PSP scale, the most marked disorders in the patients of Group I were detected in the areas of “socially useful activities, including work and study” constituting 4.19 ± 0.53 points and “personal and social relationships” amounting 3.41 ± 0.62 points.

Disorders in the areas of “self-care” and “disturbing and aggressive behavior” were less significant constituting 1.73 ± 0.91 points and 1.12 ± 0.33 points, respectively. The final score was 33.5 ± 1.78 in the patients of Group I and 40.6 ± 2.1 in Group II ($p=0.01$) according to the PSP scale.

Table 2

Some indicators of the social functioning state of the examined patients ($M \pm m$)

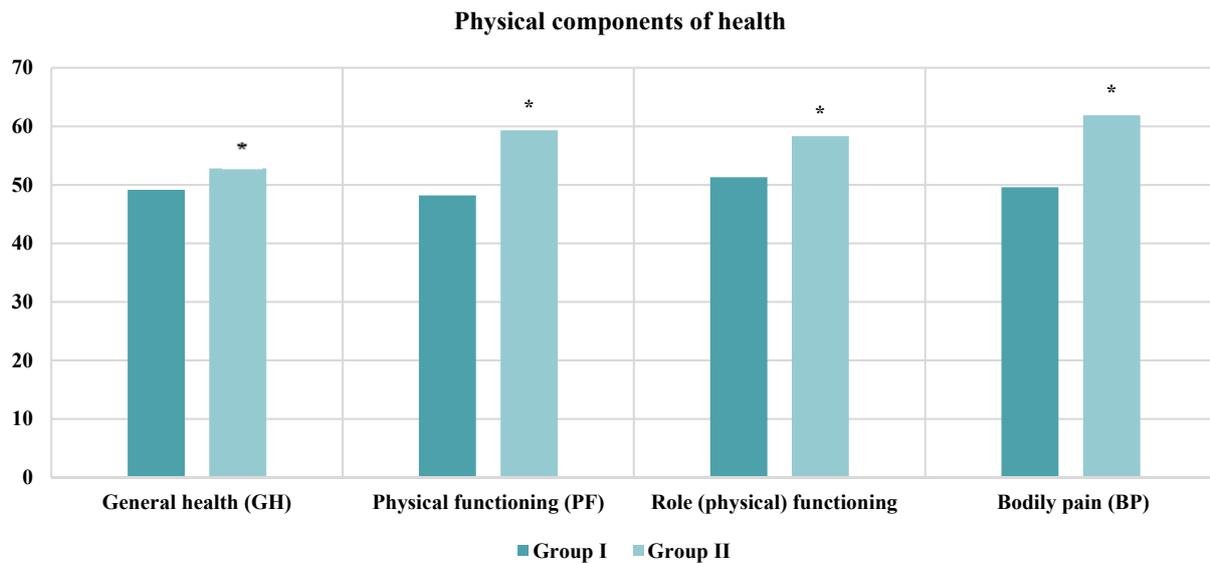
Indicator	Group I (n=50)	Group II (n=50)	The probability of difference
CGI-S scale	5.8 ± 0.6	$4.4 \pm 0.5^*$	$p=0.03$
PSP scale	33.5 ± 1.78	$40.6 \pm 2.1^*$	$p=0.01$

Note. * – $p < 0.05$ – the data are reliable between the indicators of research groups.

The disorders in such areas as “personal and social relationships” and “socially useful work” constituted 2.91 ± 0.92 points and 2.31 ± 0.72 points, respectively, in the patients of Group II. Behavioral problems were observed to a greater extent in the examined patients of Group II. The indices of “disturbing and aggressive behavior” area ranged within 3.16 ± 0.52 points. The area of “self-care” underwent the least violations in this group of patients constituting 1.12 ± 0.33 points.

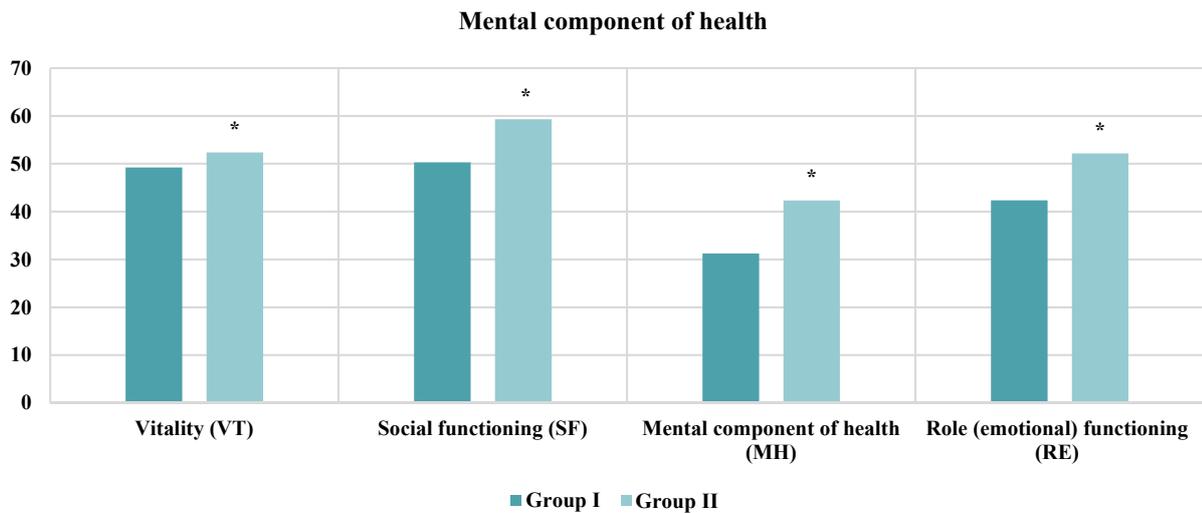
Indicators of the quality of life of the examined patients are presented in Figures 5a and 5b. In particular, physical health of the examined patients is presented in Figure 5a. The indicator of general health

(GH) in patients of Group I averaged 49.16 ± 2.31 , which was 6.9% lower than in patients of Group II, where this index constituted 52.81 ± 1.63 ($p=0.19$). Physical functioning (PF) constituted 48.2 ± 2.17 among the patients of Group I, which was 18.4% worse than in Group II, where this index was 59.32 ± 0.97 ($p < 0.05$). The role functioning (RP) in the patients of Group I averaged 51.3 ± 1.32 , which was 12.02% lower than in Group II, with a rate of 58.31 ± 0.75 ($p < 0.05$). The bodily pain (BP) was 49.6 ± 1.85 and 61.9 ± 2.31 in Groups I and II, respectively. The difference between the mean values of this indicator was 19.8% ($p < 0.05$).



* – $p < 0.05$ – the data are reliable between the indicators of research groups.

Fig. 5a. Indicators of quality of life (physical health) in the examined patients



* – $p < 0.05$ – the data are reliable between the indicators of research groups.

Fig. 5b. Indicators of quality of life (mental component of health) in the examined patients

The mental component of the examined patients' health is presented in Figure 5b. Vitality (VT) constituted 49.23 ± 1.03 in the patients of Group I which was 5.97% less than in Group II, where this index was 52.36 ± 0.55 ($p < 0.05$). Social functioning (SF) was 50.31 ± 1.05 in the patients of Group I, which was 15.18% lower than in Group II where it constituted 59.32 ± 1.13 ($p < 0.05$). Mental health was rated 31.26 ± 0.37 on average among the patients of Group I and 42.31 ± 1.08 among the examined patients in Group II. The difference between the mean values of this indicator was as much as 26.11% ($p < 0.05$).

Whereas, the role (emotional) functioning (RF) of the examined patients amounted to 42.36 ± 0.91 and 52.16 ± 0.64 , respectively. The difference between the mean values of this indicator was 18.7% ($p < 0.05$).

The results of the correlation analysis between the averages indices of the PSP scale and the data of the CIRS system and the Charlson Comorbidity Index are presented in Table 3.

The obtained indices showed that such patterns as “socially useful activity”, “self-care”, “disturbing and aggressive behavior” negatively correlated with CIRS system indices and Charlston Comorbidity

Index, while “personal relationships” had weak positive correlation. Thus, the higher the level of comorbidity was, namely the greater the number of body systems involved in the pathological process, the lower, and therefore worse were the indicators of socially useful work, ability to self-care decreased

and anxiety and aggressive behavior increased. Such tendency was observed in both groups, with a more significant manifestation in the patients with schizophrenia. Our data are comparable with some data from Ishigooka J and co-authors and Burges PM and co-authors [18, 23].

Table 3

Results of correlation analysis between the average indicators according to PSP scale and CIRS system and Charlson Index data

Indicators of PSP scale				CIRS system			Charlson Comorbidity Index
				total value	the number of categories involved	multicomorbidity index	
Socially useful activity	Group I	r	-0.513	-0.413	-0.416	-0.365	
		p	<0.05	<0.05	<0.05	<0.05	
	Group II	r	-0.431	-0.208	-0.237	-0.257	
		p	<0.05	<0.05	<0.05	<0.05	
Personal relationships	Group I	r	0.212	0.223	0.213	0.132	
		p	<0.05	<0.05	<0.05	>0.05	
	Group II	r	0.234	0.135	0.203	0.196	
		p	<0.05	>0.05	<0.05	>0.05	
Self-care	Group I	r	-0.527	-0.401	-0.312	-0.321	
		p	<0.05	<0.05	<0.05	<0.05	
	Group II	r	-0.321	-0.321	-0.281	-0.261	
		p	<0.05	<0.05	<0.05	<0.05	
Disturbing and aggressive behavior	Group I	r	-0.562	-0.401	-0.397	-0.391	
		p	<0.05	<0.05	<0.05	<0.05	
	Group II	r	-0.317	-0.319	-0.307	-0.216	
		p	<0.05	<0.05	<0.05	<0.05	

CONCLUSIONS

1. Due to The Cumulative Illness Rating Scale, we detected undiagnosed comorbidity that aggravated the course of the underlying disease: 38% in Group I and 26% in Group II.

2. The Charlson Comorbidity Index proved to be useful in the inpatient treatment of the examined patients allowing the assessment of 10-year mortality risk. Such information will make the treatment approach even more individual and comprehensive.

3. The most common components in the structure of comorbidity in the patients with schizophrenia were diabetes mellitus, musculoskeletal diseases, cardiovascular diseases, non-alcoholic fatty liver disease. Therefore, we recommended a regular monitoring of glucose profile, control of body mass

index, blood pressure, and liver function indices for this category of patients.

4. Patients with schizotypal disorders were more often diagnosed with peripheral vascular diseases, chronic lung diseases, chronic kidney diseases, and upper gastrointestinal tract disorders. Determination of lipid profile indices, the calculation of the atherogenic index, monitoring of the kidneys functional state, treatment of detected conditions, chronicity prevention were recommended for those patients.

5. An interesting relation was found when analyzing the results of the correlation analysis between The Personal Social Performance Scale average indices and The Cumulative Illness Rating Scale data and the Charlson Comorbidity Index. The indicator of “personal relationships” had a positive correlation

compared to all others, i.e. patients with more severe and numerous pathologies and worse prognosis had better relationships with relatives and friends.

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