

Exploring health behaviours among patients diagnosed with schizophrenia

Paulina Księżopolska, Michał Śmietanka, Artur Stasiniewicz,
Patrik Głowczyński, Paweł Dębski, Karina Badura-Brzoza

Abstract

Introduction: Schizophrenia, which belongs to the group of psychotic disorders, significantly reduces the quality of life of patients. Difficulties in the course of the illness cover many areas of functioning – from self-perception and acceptance of the disease to professional and social activity, including health-promoting behaviors that are important for mental and physical hygiene.

Objective: The aim of the study was to assess health-promoting behaviours in patients with schizophrenia and to analyse their relationship with the level of acceptance of the disease, life satisfaction, and the severity of anxiety and depressive symptoms. The aim of the study was also to assess the significance of differences in the studied variables between women and men diagnosed with schizophrenia.

Material and methods: The study included 70 patients receiving care at a mental health clinic, of whom 54.29% were women and 45.71% were men. The following psychometric tools were used: the Satisfaction with Life Scale (SWLS), the Hospital Anxiety and Depression Scale (HADS), the Acceptance of Illness Scale (AIS), the Health Behaviour Inventory (HBI), and an original demographic data questionnaire. Statistical analysis was performed using the U Mann-Whitney test and Spearman's rank correlation coefficient. The study received a positive opinion from the Bioethics Committee of the Medical University of Silesia (PCN/0022/KBI/67/21).

Results: Statistically significant negative correlations were found between the overall health behavior score (HBS) and subscores—health practices, preventive behaviors, positive mental attitude—and the severity of depressive symptoms (HADS-D). Additionally, the positive mental attitude subscale correlated negatively with both anxiety and depressive symptoms. No significant differences were found between women and men in terms of the variables studied.

Conclusions: Among patients with schizophrenia, a higher level of pro-health behaviours is associated with a lower severity of depression and anxiety symptoms. These results emphasize the importance of promoting a pro-health lifestyle in this group of patients. Further research is needed to allow for an in-depth analysis of the relationships obtained and to verify the conclusions.

schizophrenia; health behaviours; quality of life; anxiety; depression

Paulina Księżopolska¹, Michał Śmietanka¹, Artur Stasiniewicz¹,
Patrik Głowczyński², Paweł Dębski², Karina Badura-Brzoza²:

¹Department of Psychiatry in Tarnowskie Góry, Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice, Poland; ²Department of Psychiatry in Tarnowskie Góry, Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice, Poland

Corresponding author: Artur Stasiniewicz; arturstasiniewicz@wp.pl

INTRODUCTION

Schizophrenia is a psychotic disorder that affects approximately 24 million people worldwide [1]. The symptoms of the disease are mul-

tifaceted and affect various areas of an individual's functioning. Patients often struggle with a poorer quality of life and are additionally burdened with an increased risk of premature death, by 10–20 years compared to healthy individuals [2,3]. It is estimated that approximately 70% of premature deaths in people with schizophrenia are due to somatic diseases, mainly metabolic and cardiovascular [4]. There may be various reasons for this phenomenon. On the one hand, neuroleptic drugs, which are necessary to control the disease, may contribute to the development of metabolic syndrome, which is associated with a high risk of hypertension, ischemic heart disease, and diabetes [5]. On the other hand, the symptoms of the disease themselves, especially the negative ones, such as social withdrawal, anhedonia, apathy, and abulia, cause a decrease in physical activity, less attention to a healthy lifestyle, including a balanced diet and abstinence from psychoactive substances [6]. In addition, factors such as sedation associated with antipsychotic treatment, symptoms of anxiety and depression, lower levels of education, and lack of experience in physical exercise significantly reduce motivation to adopt a more active lifestyle [7]. Human health is influenced by many different factors, ranging from genetic conditions, external environmental factors, to lifestyle. The latter is shaped from early childhood, and one of its elements that can have a significant impact on quality of life is health behavior. Health-promoting behaviors are aimed at maintaining, improving, or restoring somatic and mental health, and include proper nutrition, physical activity, and sleep hygiene [5,6]. Therefore, it seems that attention to health-promoting behaviors in this group of patients should be of particular importance.

OBJECTIVE

The aim of the study was to assess pro-health behaviours and to analyze their relationship with life satisfaction, disease acceptance, and the severity of anxiety and depressive symptoms in a group of patients diagnosed with schizophrenia. The study also aimed to assess the significance of differences in the studied variables between women and men with schizophrenia.

MATERIAL AND METHODS

The study was conducted in 2020–2022 at the Mental Health Clinic (MHC) located in the Upper Silesian metropolis in Poland. Initially, 178 people were qualified for the study who had at least one year of medical history, reported to the MHC during the above-mentioned study period, and gave their consent. Questionnaires were returned by 86 patients, and only completely filled-out questionnaires were included in the final analysis. The study population consisted of 70 individuals, including 44 women aged 44.06 ± 14.89 years and 26 men aged 40.84 ± 16.72 years. All subjects had been diagnosed with schizophrenia according to DSM-5 classification, and the severity of their symptoms during the study was rated at 4 points on a 7-point Likert scale. The patients' condition allowed them to complete the research questionnaires, each of them was in remission from their illness. None of the study participants presented active psychotic symptoms during research. All subjects consented to participate in the project. The sociodemographic characteristics of the subjects are presented in Table 1.

Table 1. Demographic characteristics of the study group.

VARIABLE	WOMEN (n=38)	MEN (n=32)	ALL (N=70)
AGE (mean±SD)	44.84 ±15.97	42.72±14.60	43.87±15.39
MARITAL STATUS – TOTAL (%)			
Single/Divorced	17 (49.95%)	17 (53.13%)	34 (49.28%)
Formal relationship/cohabitation	20 (54.05%)	15 (46.88%)	35 (50.72%)
LIVING WITH SOMEONE – TOTAL (%)			
Yes	26 (70.27%)	26 (81.25%)	52 (75.36%)
No	11 (29.73%)	6 (18.75%)	17 (24.64%)

EDUCATION – TOTAL (%)			
Higher (University)	16 (43.24%)	8 (25%)	24 (34.78%)
High school (+Student)	15 (40.54%)	21 (65.63%)	36 (52.17%)
Primary+Professional education	6 (16.22%)	3 (9.38%)	9 (13.05%)
DURATION (YEARS)	5.17	9.69	7.18
BMI	28.13	27.95	28.05

Methods

A set of standardized psychometric tools and an original questionnaire were used to assess the analyzed variables. A detailed description of the methods used is presented below:

1. **Original Demographic Data Questionnaire**
A questionnaire created for the purposes of this project was used to collect basic information about the study participants. It included questions about, among other things: gender, age, place of residence (city/village), relationship status (being in a relationship), level of education, and other sociodemographic variables.

2. **Juczynski's Health Behaviour Inventory (HBI)**

The only tool in Poland used for comprehensive measurement of pro-health behaviors. It consists of 24 statements, rated on a five-point scale (from "almost never" to "almost always"), allowing for the assessment of four areas: proper eating habits (PEH), preventive behaviors (PB), health practices (HP), and positive mental attitude (PMA). The results obtained can be summed up to obtain an overall health behaviour index (range 24–120 points). The higher the score, the greater the intensity of desirable health-promoting attitudes and actions. After converting the results to a sten scale, they can be interpreted in relation to the general population. This tool is widely used in research on health promotion, prevention of lifestyle diseases, and intervention programs [8].

3. **Diener's Satisfaction with Life Scale (SWLS)**
The scale measures subjective satisfaction with life, defined as an overall assessment of the quality of one's functioning. The questionnaire consists of five statements, to which the respondent responds on a seven-

point Likert scale (from "strongly disagree" – 1 point, to "strongly agree" – 7 points). The total score ranges from 5 to 35. This result can be converted into standardized units (Sten scale), which allows the level of satisfaction to be classified as low (1–4 sten), average (5–6 sten), or high (7–10 sten). The Diener's SWLS scale is widely used in both clinical and population studies [7].

4. **Felton's Illness Acceptance Scale (AIS)**

A tool developed by Felton and coworkers, adapted into Polish by Jurczyński. This scale is used to assess the degree of acceptance of one's own chronic illness. The questionnaire contains 8 statements describing the negative consequences associated with the illness. Respondents rate each statement on a five-point scale, which allows for a score ranging from 8 to 40 points. Lower scores (8–19) indicate low acceptance of the disease, which may be associated with greater emotional discomfort and difficulties in adaptation. Average (20–35) and high (36–40) scores indicate better psychological adaptation and greater readiness to cope with the limitations resulting from the disease. This scale is used not only in scientific research, but also in clinical practice, where it serves to monitor the patient's progress in accepting the diagnosis [8,9].

5. **Hospital Anxiety and Depression Scale (HADS)**

It consists of two subscales: HADS-A (anxiety assessment) and HADS-D (depression assessment), each of which contains 7 items. Respondents assess the frequency of symptoms in the last week, with a possible score in each subscale ranging from 0 to 21 points. Scores of 0–7 are considered normal, 8–10 are borderline, and ≥ 11 indicate the presence of a disorder [8,9,10].

Statistical analysis of data

Standard statistical procedures were used in the analyses. The Shapiro-Wilk test was used to assess the normality of the distributions. Due to the difference between the distributions of the studied variables and the normal distribution, non-parametric methods were used in further analyses. The Mann-Whitney U test was used to assess the significance of differences between the women and men studied. Spearman's rank correlation coefficient was used to assess the relationships between the data. A significance level of $\alpha \leq 0.05$ was adopted as statistically significant. The calculations were performed using Statistica version 13.3 and Excel 2016.

The Bioethics Committee of the Medical University of Silesia approved the study (PCN/0022/KBI/67/21).

RESULTS

1. Health behaviours

An analysis of the results obtained in the study group in the Juczynski's HBI yielded an average score of 74.319 points, and after division into groups, 73.514 points among women and 75.250 points among men. When converted to z-scores, all three results are at the average level. The groups did not differ statistically in terms of the overall Juczynski's HBI score and in individual subscales (Tables 2 and 3).

Table 2. Descriptive statistics of variables for the entire study group.

Variable	Mean	Standard deviation	Median	Min.	Max.
AIS	24.232	7.854	23.000	18.000	30.000
SWLS	15.594	5.149	15.000	12.000	20.000
HADS-A	10.449	4.234	11.000	8.000	13.000
HADS-D	7.319	4.431	7.000	4.000	11.000
HBI	74.319	10.936	74.000	67.000	82.000
PEH	2.792	0.869	2.667	2.083	3.500
PB	3.441	0.693	3.333	3.000	4.000
PMA	3.017	0.620	3.083	2.667	3.500
HP	3.174	0.520	3.000	2.833	3.667

AIS – Acceptance of Illness Scale, HADS – A– Hospital Anxiety and Depression Scale – Anxiety, HADS – D– Hospital Anxiety and Depression Scale – Depression, SWLS – The Satisfaction with Life Scale, HBI – health behaviours inventory (in general), PEH – proper eating habits, PB – preventive behaviours, PMA – positive mental attitude, HP – health practices

Table 3. Gender differences in the severity of the variables studied.

	Women (n=38)			Men (n=32)			U Mann-Whitney	
	Mean	Standard deviation	Median	Mean	Std. dev.	Median	Z	p
HBI	73.514	10.474	75.000	75.250	11.545	72.500	-0.235	0.814
PEH	2.779	0.823	2.667	2.806	0.935	2.667	-0.012	0.990
PB	3.365	0.794	3.333	3.532	0.548	3.333	-0.486	0.627
PMA	2.914	0.561	2.833	3.140	0.674	3.167	-1.447	0.148
HP	3.194	0.535	3.000	3.151	0.510	3.000	0.246	0.805
AIS	24.324	7.427	23.000	24.125	8.393	23.500	0.156	0.876

SWLS	15.865	5.255	15.000	15.281	5.088	15.000	0.174	0.861
HADS-A	10.838	4.253	10.000	10.000	4.235	11.000	0.560	0.576
HADS-D	7.838	4.586	9.000	6.719	4.237	7.000		

HBI – health behaviours inventory (in general), PEH – proper eating habits, PB – preventive behaviours, PMA – positive mental attitude, HP – health practices, AIS – Acceptance of Illness Scale, HADS – A– Hospital Anxiety and Depression Scale – Anxiety, HADS – D– Hospital Anxiety and Depression Scale – Depression, SWLS – The Satisfaction with Life Scale

2. Diener's Life satisfaction

A tool developed by Diener, Emmons, Larson, and Griffin, adapted into Polish by Z. Juczyński. When analysing the results obtained in the Diener's SWLS study group, an average score of 15.594 points was obtained, which, when converted to stens, allows the level of life satisfaction to be estimated as low (Table 2). After dividing into groups, the results were 15.865 points for women and 15.281 points for men, with no statistically significant difference between the two (Table 3).

3. Felton's Acceptance of the disease

A tool developed by Diener, Emmons, Larson, and Griffin, adapted into Polish by Z. Juczyński. When analysing the results obtained in the study group on the AIS scale, an average score of 24.232 points was obtained, indicating a medium level of acceptance of the disease (Table 2). When analysing the results separately in the group of women, the score was 24.324 points, and in the group of men, 24.125 points, with no statistically significant difference between the two groups (Table 3).

4. Zigmond's Anxiety and depressive symptoms

The scale was developed by Zigmond and Snaith with the aim of creating a tool suitable for hospital patients, in which the influence of somatic symptoms is minimized. When analysing the results obtained in the study group on the HADS scale, the average score on the depression subscale was 7.319 points, and on the anxiety subscale, 10.449 points (Table 2). After dividing into groups, the depression scale yielded 7.838 points for women and 6.719 points for men, with no statistically significant difference. On the anxiety subscale, 10.838 points were obtained for women and 10.000 points for men, with no statistically significant difference (Tables 2 and 3).

5. Analysis of relationships between the parameters studied

The analysis of the relationship between the parameters studied is presented for all patients combined. Significant negative correlations were found between health behaviours (HBI with subscales) and the severity of depression symptoms (HADS-D). In addition, the result in the positive mental attitude subscale correlated negatively with both anxiety and depressive symptoms. No significant differences were found between women and men in terms of the studied variables (Table 4).

Table 4. Associations between life satisfaction, illness acceptance, health behaviours and an intensity of anxiety and depression symptoms in a group of patients diagnosed with schizophrenia.

n=70	AIS	SWLS	HADS – A	HADS – D	HBI	PEH	PB	PMA	HP
AIS	1.000	0.048	0.084	-0.062	-0.025	-0.102	-0.130	-0.089	0.012
SWLS		1.000	0.015	-0.071	-0.039	-0.150	-0.043	-0.108	0.040
HADS – A			1.000	0.706*	-0.215	0.056	-0.192	-0.348*	-0.176
HADS – D				1.000	-0.355*	-0.026	0.349*	0.371*	0.291*

AIS – Acceptance of Illness Scale. HADS – A– Hospital Anxiety and Depression Scale – Anxiety. HADS – D– Hospital Anxiety and Depression Scale – Depression. SWLS – The Satisfaction with Life Scale. HBI – health behaviours inventory (in general). PEH – proper eating habits. PB – preventive behaviours. PMA – positive mental attitude. HP – health practices. * p≤0.05

DISCUSSION

Schizophrenia, a psychotic disorder, is associated with significant difficulties in patients' quality of life [11,12,13,14]. These difficulties affect various areas, such as self-perception, acceptance of the illness, and functioning in social and professional roles. The phenomenon of stigmatization by the environment or self-stigmatization of patients, which is still observed, is also relevant [15]. Equally important, schizophrenia is often accompanied by coexisting somatic conditions, such as lipid metabolism disorders, difficulties in maintaining a healthy body weight, and more severe and earlier onset of coronary heart disease, diabetes, and hypertension than in the general population [4,16]. The poorer functioning of patients with schizophrenia is partly due to the factors mentioned above and has a significant impact on lifestyle and health habits. On the other hand, the lack of proper health-promoting behaviours may contribute to a greater susceptibility to metabolic disorders in this group of patients. Patients often do not follow a diet, consume alcohol or other psychoactive substances, and smoke large amounts of cigarettes [17,18,19]. Their eating habits are also worse. Studies show that patients diagnosed with schizophrenia consume significantly more foods rich in fat than in fibre and more processed foods than patients suffering only from somatic disorders [19]. In a study by Yu et al., the health behaviours of a group of 152 patients diagnosed with schizophrenia were analysed [20]. The authors considered seven aspects of health-promoting activities, five of which proved to be statistically significant in relation to population norms. It was proven that the health knowledge of the study participants did not have a direct impact on the manifestation of health-promoting behaviours, but an indirect impact was found [20]. Other parameters taken into account, such as social support and the symptoms of mental illness presented, had a significant impact through a sense of self-efficacy in terms of caring for health habits. These results indicate the importance of considering awareness of the role of health habits and social support as areas that have not yet received much attention in the context of studying pro-health behaviours among patients with schizophrenia [20].

It is interesting to note that in the cited study, as in our analyses, people with schizophrenia achieved an average score on the SWLS scale and on the scales assessing pro-health behaviours [20]. Patients suffering from schizophrenia spectrum disorders often admit that their subjectively perceived quality of life is low [16,19,21]. A similar result was achieved by our respondents assessed on the SWLS life satisfaction scale. In a study by Furrer et al., a cross-sectional study was conducted with 94 people with schizophrenia spectrum disorders in rural areas and a small town in the Swiss Alps and the Principality of Liechtenstein [22]. The results obtained suggest a clear relationship between QoL and the degree of patient satisfaction with psychiatric therapy, which, in addition to the actual perception of the treatment used, also includes the impression of the therapeutic facilities where the patients under study are treated [22]. Our considerations are also related to the results of studies by Gee et al., who described five dominant factors influencing the quality of life (QoL) of patients with schizophrenia: uncertainty and lack of control, responses of others and reactions to others, feelings of detachment and isolation, anxiety, and limited choices [23]. One of the results of our analysis is the low score of the study group based on the SWLS assessment. Similar observations have been reported in other studies, including that by Rozya et al. [24]. The aim of this study was to determine the personality traits of people with schizophrenia and to attempt to demonstrate their significance in relation to life satisfaction, as well as to identify differences and similarities in personality traits between people with schizophrenia and healthy individuals. The study involved 40 people diagnosed with schizophrenia and 40 healthy individuals. The following tools were used to evaluate the participants: the Satisfaction with Life Scale (SWLS), the Socio-Demographic Data Questionnaire, and the International Personality Inventory Scale – Values in Action (IPIP-VIA) [16]. It was shown that patients with schizophrenia differ from healthy individuals in terms of their experience of life satisfaction [13]. The character traits of people in the clinical group (more often than in the control group) are associated with a sense of life satisfaction [13].

Our study showed a low life satisfaction rating among participants. In the context of this as-

pect, similar observations were made in a study by Palijan et al. [25]. In their analysis, the authors took into account 88 people with schizophrenia, 60 people struggling with physical disabilities, and 57 people with psoriasis. All three groups completed the Satisfaction with Life Scale (SWLS). [25]. People with schizophrenia were less satisfied with their lives compared to people suffering only from somatic conditions, including psoriasis, and those struggling with physical disabilities. Interestingly, however, the study found that people with schizophrenia had higher expectations for the future than people with physical disabilities and people with psoriasis [25].

Our study revealed higher levels of perceived anxiety in the group of female patients with schizophrenia compared to males. Similar results have been obtained in previously published studies aimed at determining the relationship between anxiety in schizophrenia and health habits [26,27,28]. However, we did not find a significant relationship between perceived life satisfaction or acceptance of the disease and health behaviours [29,30]. Coping with increased tension and anxiety causes additional difficulties in planning the day, including time for preparing nutritious meals or engaging in physical activity [31,32,33]. On the other hand, it encourages unhealthy habits, such as reaching for stimulants to relieve accumulated tension, which brings patients short-term relief [34,35].

Both depressive symptoms, including prolonged low mood, social withdrawal, anhedonia, and difficulties maintaining a proper balance between sleep and wakefulness, and anxiety symptoms are common among patients with schizophrenia [31,32]. Chronic low energy, increased psychosomatic tension, and anxiety are not conducive to building and maintaining healthy eating habits, ensuring adequate physical activity, or proper sleep hygiene. Instead, they may encourage unhealthy habits, such as using stimulants to relieve accumulated tension, which provides only short-term relief [34,35]. There are significant differences between women and men with schizophrenia in the course of the disease, their approach to treatment, medication use, and the dynamics of both positive and negative symptoms [35]. This makes it all the more important to seek gender-related differences in be-

haviours that promote somatic health [36]. However, in our study, we did not find any significant differences between women and men in the studied variables.

CONCLUSIONS

Among patients with schizophrenia, higher levels of health-promoting behaviours were associated with lower severity of depressive and anxiety symptoms. These findings highlight the importance of promoting a healthy lifestyle in this patient group. Further research is needed to enable a more in-depth analysis of the observed relationships and to verify these conclusions.

Limitations of the study:

1. Small research group.
2. Study conducted in a single medical facility.
3. Assessment based on self-report questionnaires.
4. The statistical methods used only allow for the assessment of the relationship, not the dependence between parameters.
5. No assessment of other factors, e.g. sociodemographic factors, on the parameters studied.

Author Contributions: *Conceptualization, K.B.B.; Methodology, P.G.; Formal Analysis, P.K., A.S., M.Ś.; Investigation, P.K., A.S., M.Ś.; Resources, P.K., A.S., M.Ś.; Data Curation, P.D., P.K., A.S., M.Ś.; Writing – Original Draft Preparation, P.K., A.S., M.Ś.; Writing – Review and Editing, K.B.B., P.D., P.G.; Supervision, K.B.B., P.D.; Funding Acquisition, K.B.B. All authors have read and agreed to the published version of the manuscript.*

Conflicts of Interest: *The authors declare no conflicts of interest. This research received no external funding.*

REFERENCES

6. Bogdańska E, Rysiak E, Czajkowski P, et al. *Schizofrenia – problem społeczny i ekonomiczny*. Pol Prz Nauk Zdr. 2016;4:396-400.
7. Łopuszko A, Lebiecka Z, Rudkowski K, Kucharska-Mazur J, Samochowiec J. *Wysiłek fizyczny jako terapia wspomagająca w leczeniu schizofrenii*. *Psychiatria*. 2019;16(1):33-43.
8. McGrath J, Saha S, Chant D, et al. *Schizophrenia: a concise overview of incidence, prevalence, and mortality*. *Epidemiol Rev*. 2008;30:67-76. doi:10.1093/epirev/mxn001.

9. Correll CU, Solmi M, Veronese N, et al. *Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: a large-scale meta-analysis of 3,211,768 patients and 113,383,368 controls*. World Psychiatry. 2017;16(2):163-180. doi:10.1002/wps.20420.
10. Correll CU, Detraux J, De Lepeleire J, et al. *Effects of antipsychotics, antidepressants and mood stabilizers on risk for physical diseases in people with schizophrenia, depression and bipolar disorder*. World Psychiatry. 2015;14(2):119-136. doi:10.1002/wps.20204.
11. Leas L, McCabe M. *Health behaviors among individuals with schizophrenia and depression*. J Health Psychol. 2007;12(4):563-579. doi:10.1177/1359105307078162.
12. Soundy A, Freeman P, Stubbs B, et al. *The value of social support to encourage people with schizophrenia to engage in physical activity: an international insight from specialist mental health physiotherapists*. J Ment Health. 2014;23(5):256-260. doi:10.3109/09638237.2014.951481.
13. Juczyński Z. *Narzędzia pomiaru w promocji i psychologii zdrowia*. Warszawa: Pracownia Testów Psychologicznych; 2009. p. 110-126.
14. Jarema M, red. *Psychiatria*. Warszawa; 2011. p. 123-132.
15. Zigmond AS, Snaith RP. *The Hospital Anxiety and Depression Scale*. Acta Psychiatr Scand. 1983;67:361-370.
16. Németh B, Fasseeh A, Molnár A, Bitter I, Horváth M, Kóczyán K, et al. *A systematic review of health economic models and utility estimation methods in schizophrenia*. Expert Rev Pharmacoecon Outcomes Res. 2018;18(3):267-275. doi:10.1080/14737167.2018.1430571.
17. Gandhi S, Gurusamy J, Damodharan D, Ganesan V, Palaniappan M. *Facilitators of healthy lifestyle behaviors in persons with schizophrenia: a qualitative feasibility pilot study*. Asian J Psychiatr. 2019;40:3-8. doi:10.1016/j.ajp.2019.01.003.
18. Taliercio J, Bonasera B, Portillo C, Ramjas E, Serper M. *Physical activity, sleep-related behaviors and severity of symptoms in schizophrenia*. Psychiatry Res. 2020;294:113489. doi:10.1016/j.psychres.2020.113489.
19. Lora A, Monzio Compagnoni M, Allevi L, Barbato A, Carle F, D'Avanzo B, et al. *The quality of mental health care delivered to patients with schizophrenia and related disorders in the Italian mental health system. The QUADIM project: a multi-regional Italian investigation based on healthcare utilisation databases*. Epidemiol Psychiatr Sci. 2022;31:e15. doi:10.1017/S2045796022000014.
20. Balanzá-Martínez V, Atienza-Carbonell B, Kapczinski F, De Boni RB. *Lifestyle behaviours during the COVID-19: time to connect*. Acta Psychiatr Scand. 2020;141(5):399-400. doi:10.1111/acps.13177.
21. Huang Y, Zhao N. *Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey*. Psychiatry Res. 2020;288:112954. doi:10.1016/j.psychres.2020.112954.
22. Nordentoft M, Plana-Ripoll O, Laursen TM. *Cancer and schizophrenia*. Curr Opin Psychiatry. 2021;34(3):260-265. doi:10.1097/YCO.0000000000000697.
23. Hat M, Arciszewska-Leszczuk A, Plencler I, Cechnicki A. *Predictors of satisfaction with care in patients suffering from schizophrenia treated under community mental health teams*. Community Ment Health J. 2022;58(8):1495-1504. doi:10.1007/s10597-022-00964-4.
24. Heald A, Montejo AL, Millar H, De Hert M, McCrae J, Correll CU. *Management of physical health in patients with schizophrenia: practical recommendations*. Eur Psychiatry. 2010;25 Suppl 2:S41-S45. doi:10.1016/S0924-9338(10)71706-5.
25. Bäuerle A, Teufel M, Musche V, Weismüller B, Kohler H, Hetkamp M, et al. *Increased generalized anxiety, depression and distress during the COVID-19 pandemic: a cross-sectional study in Germany*. J Public Health (Oxf). 2020;42(4):672-678. doi:10.1093/pubmed/fdaa106.
26. Yu H. *Understanding health-promoting behaviors and influential factors in schizophrenia patients*. Nutrients. 2024;16(10):1490. doi:10.3390/nu16101490.
27. Furrer M, Jakob NJ, Cattapan-Ludewing K, Seixas A, Huber CG, Schneeberger AR. *Patient satisfaction and quality of life in people with schizophrenia-spectrum disorders in a rural area*. Adm Policy Ment Health. 2018;45(2):245-253. doi:10.1007/s10488-017-0820-3.
28. Gee L, Pearce E, Jackson M. *Quality of life in schizophrenia: a grounded theory approach*. Health Qual Life Outcomes. 2003;1:31. doi:10.1186/1477-7525-1-31.
29. Rozya P, Sawicka M, Żochowska A, Bronowski P. *Strengths in patients with schizophrenia and healthy people: similarities and differences*. Psychiatr Pol. 2019;53(1):93-104. doi:10.12740/PP/81109.
30. Palijan TŽ, Kovačević D, Vlastelica M, Dadić-Hero E, Sarilar M. *Quality of life of persons suffering from schizophrenia, psoriasis and physical disabilities*. Psychiatr Danub. 2017;29(1):60-65. doi:10.24869/psyd.2017.60.
31. Opoka SM, Lincoln TM. *The effect of cognitive behavioral interventions on depression and anxiety symptoms in patients with schizophrenia spectrum disorders: a systematic review*. Psychiatr Clin North Am. 2017;40(4):641-659. doi:10.1016/j.psc.2017.08.005.
32. Chen S, Sun X, Zhu Q, Zhao Y, Tang J, Song H. *Factors influencing the level of depression and anxiety of community-dwelling patients with schizophrenia in China during the COVID-19 pandemic*. Int J Environ Res Public Health. 2023;20(5):4376. doi:10.3390/ijerph20054376.
33. Karpov B, Joffe G, Aaltonen K, Suvisaari J, Baryshnikov I, Näätänen P, et al. *Anxiety symptoms in major mood and schizophrenia spectrum disorders*. Eur Psychiatry. 2016;37:1-7. doi:10.1016/j.eurpsy.2016.04.007.

34. Gerymski R, Szelag M. *Sexual well-being in individuals with schizophrenia: a pilot study on the role of self-esteem and acceptance of illness*. Eur J Investig Health Psychol Educ. 2023;13(7):1318-1329. doi:10.3390/ejihpe13070097.
35. Hofer A, Kemmler G, Eder U, Edlinger M, Hummer M, Fleischhacker WW. *Quality of life in schizophrenia: the impact of psychopathology, attitude toward medication, and side effects*. J Clin Psychiatry. 2004;65(7):932-939.
36. von Hausswolff-Juhlin Y, Bjartveit M, Lindström E, Jones P. *Schizophrenia and physical health problems*. Acta Psychiatr Scand Suppl. 2009;(438):15-21. doi:10.1111/j.1600-0447.2008.01309.x.
37. Rojanaworarit C, Songsiripraduboon S, Worahan V, Kerdpon P, Photisan N. *Complex medical conditions and health risk behaviors among homeless males with schizophrenia*. Narra J. 2025;5(1):e1194. doi:10.52225/narra.v5i1.1194.
38. Vancampfort D, Knapen J, Probst M, Scheewe T, Remans S, De Hert M. *A systematic review of correlates of physical activity in patients with schizophrenia*. Acta Psychiatr Scand. 2012;125(5):352-362. doi:10.1111/j.1600-0447.2011.01814.x.
39. Findlay LJ, El-Mallakh P, Howard PB, Hatcher J, Clark JJ. *Health behavior decision-making in African-American adults diagnosed with schizophrenia*. Issues Ment Health Nurs. 2015;36(7):493-504. doi:10.3109/01612840.2014.1002646.
40. Meepring S, Chien WT, Gray R, Bressington D. *Effects of the Thai Health Improvement Profile intervention on the physical health and health behaviours of people with schizophrenia: a quasi-experimental study*. Int J Ment Health Nurs. 2018;27(1):126-137. doi:10.1111/inm.12301.
41. Wang M, Mou X, Li T, Zhang Y, Xie Y, Tao S, et al. *Association between comorbid anxiety and depression and health risk behaviors among Chinese adolescents: cross-sectional questionnaire study*. JMIR Public Health Surveill. 2023;9:e46289. doi:10.2196/46289.