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The mood disorders and suicidal thoughts and their impact on the quality of life among people living with HIV treated in Białystok, Poland: a cross-sectional study

Zaburzenia nastroju i myśli samobójcze oraz ich wpływ na jakość życia osób zakażonych wirusem HIV leczonych w Białymstoku: badanie przekrojowe

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Abstract

Introduction and objective: The aim of the study was to assess the prevalence of mood disorders symptoms and suicidal thoughts among HIV patients treated in Białystok and their impact on quality of life. **Materials and methods:** A total of 147 participants, including 104 men (70.7%) and 43 women (29.3%), took part in the research. The study used a diagnostic survey method with a modified questionnaire "Psychosocial situation of people living with HIV/AIDS in Poland" by Dr Magdalena Ankiersztejn-Bartczak and the World Health Organization Quality of Life (WHOQOL-BREF), Short Form Health Survey (SF-36), General Health Questionnaire (GHQ-28) and Beck Depression Inventory (BDI). **Results:** Suicidal thoughts and attempts were reported by 20% and 7% of respondents, respectively. Fear of living with HIV and fear of loneliness were the predominant reasons for suicidal thoughts (38.7% in total). Two-thirds of respondents had no depressive symptoms, while one-fourth of respondents presented with at most moderate depressive symptoms. There were significant differences in the level of health problems depending on marital status. Those who had suicidal thoughts after receiving HIV diagnosis had a lower quality of life. **Conclusions:** One-third of the respondents reported symptoms of mood disorders, most of which were of moderate intensity, and one-fourth of the respondents had suicidal thoughts and attempts. The quality of life of HIV patients was mainly determined by their general physical and mental health and social support. A higher quality of life was presented by those with better general health status who received social support. Only marital status determinated the prevalence of symptoms of mood disorders in the study group.

Keywords: depression, suicidal thoughts, human immunodeficiency virus, mood disorders, quality of life

Streszczenie

Wprowadzenie i cel: Celem badania była ocena częstości występowania objawów zaburzeń nastroju i myśli samobójczych wśród pacjentów zakażonych wirusem HIV leczonych w Białymstoku i ich wpływu na jakość życia. **Materiał i metody:** W badaniu wzięło udział łącznie 147 osób, w tym 104 mężczyzn (70,7%) i 43 kobiety (29,3%). W badaniu została wykorzystana metoda sondażu diagnostycznego z użyciem zmodyfikowanego kwestionariusza ankiety pt. „Psychospołeczna sytuacja osób żyjących z HIV/AIDS w Polsce" autorstwa dr Magdaleny Ankiersztejn-Bartczak oraz standaryzowane skale psychometryczne: Skrócona Wersja Ankiety Oceniającej Jakość Życia (World Health Organization Quality of Life, WHOQOL-BREF), Kwestionariusz Oceny Jakości Życia (Short Form Health Survey, SF-36), Kwestionariusz Ogólnego Stanu Zdrowia (General Health Questionnaire, GHQ-28) oraz Skala Depresji Becka (Beck Depression Inventory, BDI). **Wyniki:** Myśli i próby samobójcze zgłaszało odpowiednio 20% i 7% ankietowanych. Strach przed życiem z HIV i strach przed samotnością były dominującymi przyczynami myśli samobójczych (łącznie 38,7%). Dwie trzecie respondentów nie miało objawów depresyjnych, natomiast u jednej czwartej ankietowanych występowały co najwyżej umiarkowane objawy depresyjne. Stwierdzono istotne różnice w poziomie problemów zdrowotnych w zależności od stanu cywilnego. Osoby, które miały myśli samobójcze po otrzymaniu diagnozy HIV, wykazywały gorszą jakość życia. **Wnioski:** Jedna trzecia badanych zgłaszała występowanie objawów zaburzeń nastroju, w większości o umiarkowanym nasileniu, a jedna czwarta miała myśli i podejmowała próby samobójcze. Jakość życia pacjentów zakażonych wirusem HIV była determinowana głównie przez ich ogólny stan zdrowia fizycznego i psychicznego oraz wsparcie społeczne. Wyższą jakość życia prezentowały osoby o lepszym ogólnym stanie zdrowia, które otrzymały wsparcie społeczne. Jedynie stan cywilny miał wpływ na częstość występowania objawów zaburzeń nastroju w badanej grupie.

Słowa kluczowe: depresja, myśli samobójcze, ludzki wirus upośledzenia odporności, zaburzenia nastroju, jakość życia

INTRODUCTION

Human immunodeficiency virus (HIV) is one of the most prevalent health problems globally (Khademi et al., 2021; Nobre et al., 2016; Vu et al., 2020). An estimated 38 million people worldwide are HIV-positive (UNAIDS, 2022), of whom about 40% are depressed (Uthman et al., 2014). In Poland, 30,092 people had been diagnosed with HIV since the introduction of testing in 1985 until 31 December 2022 (Narodowy Instytut Zdrowia Publicznego PZH – Państwowy Instytut Badawczy, 2023).

Mental health status is an important factor affecting the quality of life (QoL). It is also a particularly sensitive dimension of QoL for HIV patients. Generally, chronic conditions, including HIV infection, affect a person's mental health, leading to mood disorders such as anxiety and depression (Cal et al., 2015). Depression is a common mental disorder characterised by low mood, diminished self-worth, pessimistic thoughts, poor concentration and gradual withdrawal from social activities. According to a recent World Health Organization (WHO) report, approximately 280 million people worldwide have depression (World Health Organization, 2023).

Depression can exacerbate the already existing symptoms in HIV patients and lead to poor health outcomes. Previous studies have shown that depression is not only associated with higher HIV titres and lower CD4 cell counts, but it also accelerates the development of acquired immunodeficiency syndrome (AIDS) and increases the risk of death (Abas et al., 2014; Kingori et al., 2015). Furthermore, depression has been reported to reduce adherence to antiretroviral therapy (ART), diminish therapeutic effects and compromise treatment outcomes on both an individual and population level (Memiah et al., 2014; Wroe et al., 2015). The co-occurrence of HIV and depression usually results in longer onset and more severe symptoms, such as greater anxiety and self-stigma, loss of appetite and poor sleep quality (Akena et al., 2010).

Depression can ultimately lead to suicidal thoughts (Cal et al., 2015). According to a recent WHO report, more than 700,000 people die by suicide each year (World Health Organization, 2023). Despite improvements in the standard of treatment and care that have made HIV infection a manageable chronic condition, HIV diagnosis is still associated with a higher risk of suicidal behaviour (Lawrence et al., 2010). There are several factors that predispose HIV patients to suicide, including a conviction about death occurring sooner than expected and the death itself being prolonged and involving emotional and physical pain; fear of losing job or family, etc. (Seeley, 2015). The risk of suicide among HIV patients may be higher than in populations with other chronic diseases, such as cancer (Dannenberg et al., 1996). Suicidal thoughts are also more common among HIV patients than in the general population (Badiee et al., 2012).

So far, no representative studies have been conducted in Poland in this respect, and the available publications are scarce. Therefore, the aim of this study was to assess the prevalence of mood disorders symptoms and suicidal thoughts among HIV patients treated in the Observation and Infection Clinic with the Subunit for HIV/AIDS Patients at the Teaching Hospital of the Medical University in Bialystok and their impact on quality of life and general health.

We hypothesised that the prevalence of mood disorders symptoms and suicidal thoughts in the study group would be high. In addition, we assumed that this features would be an important factors determining the quality of life of HIV-positive people. To verify the hypotheses mentioned above, the following research questions were formulated:

1. What is the general level of prevalence of mood disorders symptoms and suicidal thoughts in the study group of patients?
2. Does the mood disorders symptoms and suicidal thoughts affect the quality of life and general health?
3. Does the sociometric variables (gender, age, marital status, etc.) determine the prevalence of mood disorders symptoms in the study group?

MATERIALS AND METHODS

Study group

The analysis included patients living with HIV of the Observation and Infection Clinic with the Subunit for HIV/AIDS Patients of the Department of Infectious Diseases and Hepatology of the Teaching Hospital of the Medical University of Bialystok and the Consultation and Diagnostic Centre at the Teaching Hospital of the Medical University of Bialystok. A total of 147 people, including 104 men (70.7%) and 43 women (29.3%), took part in the study. The mean age of the respondents ($\bar{x}$) was 42.5 years with a standard deviation (*SD*) of 10.4 years. The youngest among the patients surveyed was 22 years old, while the oldest respondent was 77 years old. Respondents with secondary education (36.1%) were the predominant group. Urban residents, with a predominance of those living in cities with more than 200,000 inhabitants (residents of Białystok), dominated in the study group. Rural respondents accounted for less than 14%. Almost one in two patients were single. Married respondents accounted for almost 30% of the surveyed group. People who were not currently in any relationship (40.1%) predominated in the study group. Non-single patients tended to report an informal relationship. The majority of respondents had children, with the largest group reporting one or two children. However, a large proportion of patients did not have children (48%). Those who were economically active accounted for more than half of the surveyed group (55.8%). The majority of respondents described their financial status as moderate (34.7%) or good (40.8%). The mean duration of infection was almost 12 years (11.8 ± 7.7), with less than 10 years since infection in half of the study group. Detailed data are shown in Tab. 1.

Study design

The study was conducted between May 2019 and January 2020 in the Observation and Infection Clinic with the Subunit for HIV/AIDS Patients and the Consultation and Diagnostic Centre of the Teaching Hospital of the Medical University of Bialystok. The inclusion criteria were as follows confirmed HIV infection, a stay in a hospital ward or a visit to the Consultation and Diagnostic Centre, and an informed and voluntary consent to participate in the study. The study was approved by the Management of the Institution and the Head of the Department. Patients' rights, including the right to intimacy and anonymity, were respected. In order to meet all ethical requirements during the implementation of the study, each respondent made a voluntary decision to take part in the study and could also withdraw from the study at any stage. The respondents completed the questionnaire unassisted due to the very personal nature of the questions, mainly contained in the survey; however, they were informed that if any doubts or problems with understanding the questions should arise, they could ask for clarification. Each patient hospitalised or presenting at the Diagnostic and Consultation Centre was asked to complete the questionnaires (in paper form) by themselves. Additionally, it was explained that the data obtained would only be used for research purposes. Patients completed the questionnaires in the patient room (in-patients), at the Consultation and Diagnostic Centre, or at home and handed them in during the next visit. The study was conducted with the involvement of persons in close contact with the patients living with HIV, i.e. infectious disease doctors, nurses, and during direct meetings with HIV patients. A total of 198 questionnaires were distributed, of which 159 (80.30%) were returned, including 12 incomplete questionnaires (19.08%), which were discarded during the analysis. A total of 147 questionnaires were included in the analysis – survey return rate of 74.25%.

Sociometric variable		***n***	**%**
Gender	Female	43	29.3%
	Male	104	70.7%
Age [years]	<30	14	9.5%
	30–39	50	34.0%
	40–49	51	34.7%
	50–59	22	15.0%
	60–69	8	5.4%
	≥70	2	1.4%
Education	Primary	31	21.1%
	Vocational	37	25.2%
	Secondary	53	36.1%
	Higher	26	17.7%
Place of residence	Rural	20	13.6%
	City up to 50,000	29	19.7%
	City of 50–100,000	39	26.5%
	City of 100–200,000	13	8.8%
	City >200,000	46	31.3%
Marital status	Single	71	48.3%
	Married	42	28.6%
	Divorced	28	19.0%
	Widow/widower	6	4.1%
Type of current relationship	Formal	40	27.2%
	Informal	48	32.7%
	No relationship	59	40.1%
Number of children	One	35	23.8%
	Two	23	15.6%
	Three	7	4.8%
	Four and more	12	8.2%
	No children	70	47.6%
Occupational activity*	Employed	82	55.8%
	Disability pensioner	29	19.7%
	Student	15	10.2%
	Retired	9	6.1%
	Jobseeker	9	6.1%
	Non-jobseeker	8	5.4%
	Not working for health reasons	8	5.4%
Financial status	Very bad	1	0.7%
	Bad	25	17.0%
	Neither good nor bad	51	34.7%
	Goods	60	40.8%
	Very good	10	6.8%

* The sum does not have to equal 100% as any number of response options could be indicated.

Tab. 1. Sociodemographic characteristics of respondents

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Measures

The study used the method of a diagnostic survey with the use of a modified questionnaire "Psychosocial situation of people living with HIV/AIDS in Poland" by Dr Magdalena Ankiersztejn-Bartczak, President of the Social Education Foundation in Warsaw. Written consent of the author was obtained for the use of the questionnaire. Additionally, the following standardised psychometric tools were used in the study: the World Health Organization Quality of Life (WHOQOL-BREF), Short Form Health Survey (SF-36), General Health Questionnaire (GHQ-28) and Beck Depression Inventory (BDI).

Modified questionnaire of the survey "Psychosocial situation of people living with HIV/AIDS in Poland" (Ankiersztejn-Bartczak, 2013)

The survey questionnaire consisted of 59 questions. All questions required a specific choice of one or more answers. Some questions were additionally open-ended, giving the respondent the opportunity to address the question more broadly or to voice his/her own view/suggestion. The questions were structured in a way that was clear and comprehensible for the patient, and referred to a retrospective analysis of the situation since receiving the diagnosis and an assessment of various aspects of life, including those relating to the last twelve months only. The questions in the questionnaire were grouped into four thematic categories:

1. socio-demographic characteristics, including age, education, place of residence, income, housing conditions;
2. diagnosis and confirmation of HIV infection;
3. the impact of the diagnosis on life, including seeking support and suicidal thoughts/attempts;
4. public reactions to information about infection.

The World Health Organization Quality of Life (WHOQOL-BREF)

The WHOQOL-BREF questionnaire contains 26 questions and is used to measure quality of life in four domains: psychological health, physical health, environment and social relationships (Division of Mental Health and Prevention of Substance Abuse, World Health Organization, 1998). The psychological domain includes positive and negative feelings, physical appearance, religion and spirituality, self-esteem, faith, sense of concentration, thinking, memory and learning. The physical domain includes rest and sleep, discomfort and pain, mobility, daily activities, dependence on medication and treatment, and ability to undertake work. In the environmental domain, respondents assessed their financial resources, sense of security, freedom, access to and quality of health care, relationships with the immediate environment, housing conditions, opportunities for rest and recreation, opportunities for acquiring new information and skills, and transport. The social domain includes interpersonal relationships, satisfaction with sexual life, and social support (Division of Mental Health and Prevention of Substance Abuse, World Health Organization, 1998). Additionally, the WHOQOL-BREF contains two questions that are analysed separately. Question 1 asks about an individual's overall perception of quality of life, and question 2 asks about an individual's overall perception of their health. Responses are scored on a 5-point scale (low score of 1 to high score of 5), with a reverse interpretation in three questions, i.e. 5 is the lowest value and 1 is the highest value. A maximum score of 20 can be obtained in each of the domains indicated above. The higher the score, the better the patients' quality of life. Cronbach's α coefficient values for each of the six domains range from 0.71 (for the social domain) to 0.86 (for the environmental domain). The overall Cronbach's α coefficient for the scale is 0.84 (Division of Mental Health and Prevention of Substance Abuse, World Health Organization, 1998).

Short Form Health Survey (SF-36)

The SF-36 was created in 1988 and is one of the most widely used generic tools for measuring health-related quality of life. It is designed for subjective assessment of health status (Brazier et al., 1992). Due to its high diagnostic sensitivity, it can be used even in the early stages of disease. The tool consists of 36 questions in 11 categories to distinguish eight aspects of quality of life, such as:

- physical function – range of typical physical daily activities (10 items);
- role limitations due to physical problems – the effect of physical health on daily activities (4 items);
- bodily pain – severity of physical pain and its impact on daily activities (2 items);
- general health perceptions – i.e. the patient's self-reported overall health in relation to their expectations and perception of health (5 items);
- vitality – level of vital energy and fatigue (4 items);
- social functioning – impact of health on social functioning (2 items);
- role limitations due to emotional problems – impact of emotional problems on daily functioning (3 items);
- perceived mental health – quantitatively classified as nervousness, irritability, depression, happiness (5 items) (Brazier et al., 1992).

Additionally, health status is assessed in comparison with the health status one year before. The type of answers to individual questions varies from dichotomous (yes/no) to 3-, 5- and 6-point Likert scales. Respondents' answers are normalised so that the resulting QoL measures range from 0 to 100, with 0 always indicating the worst QoL and a score of 100 indicating the best QoL. Cronbach's α coefficient values range from 0.73 (social functioning) to 0.96 (role limitations due to physical health, role limitations due to emotional problems and vitality) (Brazier et al., 1992).

General Health Questionnaire (GHQ-28)

The General Health Questionnaire was created by D. Goldberg as a screening tool to identify individuals at risk of non-psychotic mental disorders, as well as assess their severity (Goldberg and Hillier, 1979). The GHQ-28 questionnaire has four 7-item sub-scales: somatic symptoms, items 1–7 (GHQ-28-A); anxiety/insomnia, items 8–14 (GHQ-28-B); social impairment, items 15–21 (GHQ-28-C); and depressive symptoms, items 22–28 (GHQ-28-D). The questionnaire is one of the so-called self-report tools, in which the respondent answers the questions independently by choosing one of the given options (i.e. better than usual; same as usual; worse than usual; much worse than usual). Each item is scored from 0 to 3. The maximum score is 84. The higher the total score, the higher the risk of a non-psychotic mental disorder, with the threshold for suspicion at 23/24 (Goldberg and Hillier, 1979). The Cronbach's α coefficient for the scale oscillates between 0.9 and 0.95 (Failde et al., 2000).

Beck Depression Inventory (BDI)

The BDI was developed by Aaron Beck in 1961. It is a self-report tool for assessing the severity of depressive symptoms. It is widely used not only in psychiatric disorders, but also in internal medicine, oncology, urology, gynaecology or neurology to assess patients' mood (Beck et al., 1961). The BDI is used as a screening diagnostic tool to measure the severity of depressive symptoms, monitor its dynamics, as well as assess the efficacy of pharmacotherapy and psychotherapy. The scale consists of 21 sets of statements scored from 0 to 3 (severity). For each item, the respondent chooses one answer that, in his or her opinion, best describes his or her situation in a given time period. The total summed score can range from 0 to 63, with higher values indicating greater severity of depression. Scores are also classified into four ranges. Depending on the score obtained, the severity of depression can be determined: 0–11 – no depression; 12–26 – mild depression; 27–49 – moderate depression; 50–63 – severe depression. The Cronbach's α coefficient is 0.86 (Beck et al., 1961).

Procedure and ethical considerations

The study was carried out following the recommendations and was reviewed and approved by the Bioethics Committee of the Medical University in Bialystok (statute no. R-I-002/237/2019). All subjects gave written informed consent in accordance with the Declaration of Helsinki.

Statistical analysis

Descriptive statistics and statistical inference, with the choice of methods determined by the type and distribution of the characteristics analysed, were used for statistical analysis.

The descriptive section presents the numerical and percentage distribution of nominal characteristics, while for measurable characteristics (mainly psychometric measures) selected descriptive statistics were determined: arithmetic mean ($\bar{x}$), median (middle value) (*Me*), maximum value (max.) and minimum value (min.), standard deviation (*SD*) and lower and upper quartile (c_{25} and c_{75}).

This was followed by investigating relationships between different aspects of mental health. For this purpose, Spearman's rank correlation coefficients between the different measures were determined.

Various data analysis techniques were used to assess variation in the mental condition of respondents, depending on their demographic profile and other factors. Spearman rank correlation coefficient was used for numerical (e.g. age or time since infection) and ordinal independent factors.

When psychometric measures were compared between groups, i.e. when the independent factor was nominal (e.g. for gender, marital status, etc.), descriptive statistics were determined for the compared groups and the significance of differences between them was assessed using the Mann–Whitney test for two groups or the Kruskal–Wallis test for more groups.

Part of the analysis concerned relationships between nominal traits, e.g. between suicidal thoughts in relation to seeking support from others. In this case, appropriate contingency tables were constructed, which presented the percentage distribution of one of the traits depending on the variants of the independent factor. The significance of the relationship was assessed using the chi-square test of independence.

The results of all the above-mentioned statistical tests were interpreted using the probability (p) value, assuming a statistically significant relationship at $p < 0.05$.

RESULTS

The vast majority of respondents (73%) never attempted suicide, 20% of respondents experienced suicidal thoughts and 7% had made an unsuccessful suicide attempt due to their health status.

Fear of living with HIV, and fear of loneliness (38.7% in total) were the main reasons for suicidal thoughts, and were followed by fear of losing family (9.5%), social stigma (8.2%), loss of job (2.7%) and loss of social status (2.7%) (Tab. 2).

The vast majority of respondents (n = 126, 85.7%) did not seek support from other people or organisations to save themselves from depression and suicidal thoughts.

Reasons for suicidal thoughts	*n*	%*
Fear of living with HIV	34	23.1%
Fear of loneliness	23	15.6%
Fear of losing family	14	9.5%
Fear of stigma	12	8.2%
Fear of losing one's job	4	2.7%
Fear of losing social status	4	2.7%
No suicidal thoughts	107	72.8%

* The sum does not have to equal 100% as any number of response options could be indicated.

Tab. 2. Reasons for suicidal thoughts

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Psychometric measures		$\bar{x}$	*Me*	*SD*	c_{25}	c_{75}	Min.	Max.
GHQ-28	Somatic symptoms	2.0	1	2.3	0	4	0	7
	Anxiety, insomnia	1.9	1	2.4	0	4	0	7
	Social disfunction	1.3	0	2.1	0	2	0	7
	Depressive symptoms	0.9	0	1.7	0	1	0	7
	Total	6.1	2	7.3	0	10	0	27
BDI		11.3	7	12.6	1	17	0	58

BDI – Beck Depression Scale; **GHQ-28** – General Health Questionnaire; $\bar{x}$ – arithmetic mean; ***Me*** – median, ***SD*** – standard deviation; c_{25} – lower quartile; c_{75} – upper quartile; **min.** – minimum; **max.** – maximum.

Tab. 3. Descriptive statistics of the scales used in the study

Severity of depressive symptoms	*n*	%
Absent	93	63.3%
Moderate	35	23.8%
Severe	17	11.6%
Very severe	2	1.4%

Tab. 4. The prevalence of depressive symptoms

The remaining percentage (*n* = 20, 13.6%) reported seeking help. One person (0.7%) did not answer this question.

Comparing the mean values with the median, it can be seen that all GHQ-28 measures had a very asymmetric distribution, with the means much higher than the median, which was 0 for the two measures that were more related to the psychological aspects, meaning that the majority of respondents did not show any negative symptoms in these domains. Both the mean BDI score and the categorisation of results based on this score indicated that depressive symptoms did not pose a significant problem in the study group. Detailed data are presented in Tab. 3.

No symptoms of depression were reported by two-thirds of respondents, while one-fourth of respondents reported at most moderate symptoms. Details are shown in Tab. 4.

All correlations between the specific domains and the overall GHQ-28 measure were statistically significant, as the overall measure was very strongly or at least strongly correlated with domains (weakest with depressive symptoms, but still a correlation of 0.65) (Tab. 5).

Additionally, the correlation between the overall GHQ-28 score for mental distress and the BDI measure of depressive symptoms was assessed. The results of this analysis are presented as a scatter plot in Fig. 1. The correlation between GHQ-28 and BDI was at an average level, i.e. those with higher levels of mental distress were more likely to have depressive symptoms, but this was not a very close relationship.

All correlations between the measures of psychological distress and depressive symptoms (GHQ-28 and BDI) and QoL were statistically significant. The negative signs of the correlation coefficients are due to the different nature of the compared measures – the QoL measures assess positive phenomena, whereas the GHQ-28 and BDI measure negative phenomena. For most of the comparisons made, the correlations were of average strength. QoL in the somatic domain was most correlated with GHQ-28, while QoL in the mental domain was most correlated with BDI. Selected correlations are presented in Tab. 6.

GHQ-28	Somatic symptoms	Anxiety, insomnia	Social dysfunctions	Depressive symptoms	Total score
Somatic symptoms	1	0.72	0.66	0.45	0.88
Anxiety, insomnia	0.72	1	0.76	0.52	0.90
Social dysfunctions	0.66	0.76	1	0.55	0.82
Depressive symptoms	0.45	0.52	0.55	1	0.65
Total	0.88	0.90	0.82	0.65	1

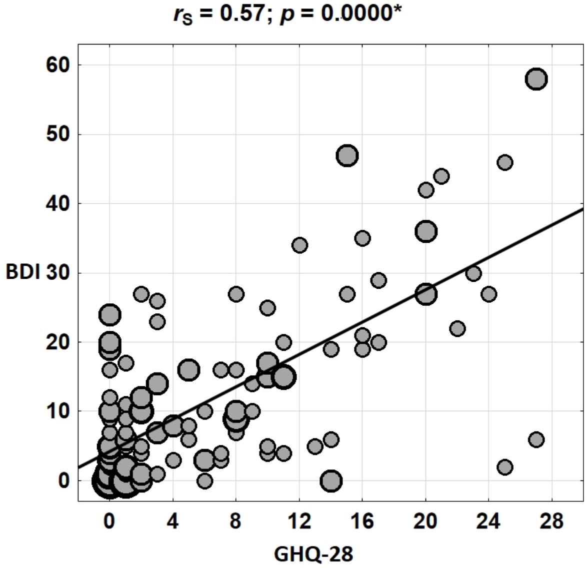
GHQ-28 – General Health Questionnaire.

Tab. 5. Correlation coefficients for specific domains and the overall GHQ-28 measure

QoL measures	Mental disorder measures	
	GHQ-28	BDI
SWLS	−0.49 ($p = 0.0000$*)	−0.55 ($p = 0.0000$*)
Somatic domain (WHOQOL-BREF)	−0.64 ($p = 0.0000$*)	−0.60 ($p = 0.0000$*)
Psychological domain (WHOQOL-BREF)	−0.55 ($p = 0.0000$*)	−0.64 ($p = 0.0000$*)
Social domain (WHOQOL-BREF)	−0.38 ($p = 0.0000$*)	−0.59 ($p = 0.0000$*)
Environment (WHOQOL-BREF)	−0.41 ($p = 0.0000$*)	−0.44 ($p = 0.0000$*)

BDI – Beck Depression Scale; **GHQ-28** – General Health Questionnaire; **SWLS** – Satisfaction with Life Scale; **WHQOL-BREF** – World Health Organization Quality of Life; ***p*** – probability value. * Statistically significant.

Tab. 6. Correlations between QoL measures and mental disorders



BDI – Beck Depression Scale; **GHQ-28** – General Health Questionnaire; r_s – Spearman's rank correlation coefficient; ***p*** – probability value.

Fig. 1. Scatter plot for the correlation between the GHQ-28 and BDI measures

The analyses showed that gender was not a differentiating factor in the QoL of HIV-positive respondents. The variation of psychometric measures within the group of women and men was definitely greater than the difference between them, which was evident after comparing the values of standard deviations against the difference of means for both groups. The fact that the Mann–Whitney test showed no statistically significant differences (*p*-values definitely above 0.05) was decisive for the reliability of conclusions. No significant differences were found across all GHQ-28 and BDI measures.

Somatic symptoms by the GHQ-28 questionnaire and depressive symptoms by the BDI questionnaire were not correlated with either age or time since infection (Tab. 8).

There were very large differences in the level of somatic symptoms reported by respondents depending on their marital status. In the case of the subscale for depressive symptoms, the difference was on the verge of statistical significance (Tab. 9).

Those who experienced suicidal thoughts after receiving HIV diagnosis were characterised by a lower quality of life, as confirmed for almost all SF-36 and WHOQOL-BREF measures. There were evident differences between the means, reaching a score of more than 30 in the case of

Psychometric measures		**Gender**						***p***
		Women (*n* = 43)			**Men (*n* = 104)**			
		$\bar{x}$	***Me***	***SD***	$\bar{x}$	***Me***	***SD***	
GHQ-28	Somatic symptoms	2.5	2	2.7	1.8	1	2.1	0.3050
	Anxiety, insomnia	2.6	2	2.8	1.6	0	2.2	0.1143
	Social dysfunctions	1.3	0	2.1	1.3	0	2.1	0.7649
	Depressive symptoms	0.8	0	1.7	0.9	0	1.7	0.6854
	Total	7.2	5.5	8.0	5.6	2	7.1	0.6777
BDI		12.0	10	11.8	11.0	7	12.9	0.4931

BDI – Beck Depression Scale; **GHQ-28** – General Health Questionnaire; $\bar{x}$ – arithmetic mean; ***Me*** – median; ***SD*** – standard deviation; ***p*** – probability value.

Tab. 7. The relationship between gender and the GHQ-28 and BDI measures

Psychometric measures		**Age [years]**	**Time since infection**
GHQ-28	Somatic symptoms	0.01 ($p = 0.9157$)	0.02 ($p = 0.7909$)
	Anxiety, insomnia	−0.04 ($p = 0.6252$)	−0.09 ($p = 0.3048$)
	Social dysfunctions	−0.07 ($p = 0.3693$)	−0.05 ($p = 0.5111$)
	Depressive symptoms	0.04 ($p = 0.6447$)	−0.09 ($p = 0.2682$)
	Total	−0.04 ($p = 0.6587$)	−0.08 ($p = 0.3134$)
BDI		0.12 ($p = 0.1634$)	−0.12 ($p = 0.1560$)

Tab. 8. Age and duration of infection vs. GHQ-28 and BDI measures

Psychometric measures		**Marital status**									***p***
		Single (*n* = 71)			**Married (*n* = 42)**			**Divorced (*n* = 34)**			
		$\bar{x}$	***Me***	***SD***	$\bar{x}$	***Me***	***SD***	$\bar{x}$	***Me***	***SD***	
GHQ-28	Somatic symptoms	2,3	2	2,3	0,6	0	1,2	3,1	2,5	2,6	0,0000*
	Anxiety, insomnia	2,2	1	2,5	0,7	0	1,6	2,8	2	2,6	0,0001*
	Social dysfunctions	2,0	1	2,4	0,2	0	0,5	1,4	0	2,1	0,0000*
	Depressive symptoms	1,2	0	1,9	0,0	0	0,2	1,3	0,5	1,9	0,0000*
	Total	7,7	6	7,7	1,5	0	2,9	8,5	5	8,0	0,0000*
BDI		13,.3	9	14,7	7,3	5	8,3	12,2	7	11,3	0,0606

BDI – Beck Depression Scale; **GHQ-28** – General Health Questionnaire; $\bar{x}$ – arithmetic mean; ***Me*** – median; ***SD*** – standard deviation; ***p*** – probability value.
* Statistically significant.

Tab. 9. Relationship between marital status and the GHQ-28 and BDI measures

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Psychometric measures		**Suicidal thoughts after receiving HIV diagnosis**						***p***
		Yes ($n = 40$)			**No ($n = 107$)**			
		$\bar{x}$	***Me***	***SD***	$\bar{x}$	***Me***	***SD***	
SF-36	Physical function	66.0	85.0	37.0	84.2	95.0	20.9	0,0320*
	Role limitations due to physical health problems	43.7	25.0	44.5	65.9	100.0	41.5	0,0191*
	Pain	55.7	47.5	34.4	69.2	77.5	28.2	0,0533
	General health	45.0	50.0	24.5	47.5	50.0	18.8	0,8099
	Role limitations due to emotional problems	46.7	33.3	48.2	79.1	100.0	37.3	0,0013*
	Vitality	43.1	46.9	16.2	42.7	43.8	13.6	0,9499
	Social functions	61.6	62.5	25.1	79.0	87.5	23.8	0,0002*
	Wellbeing	45.1	47.8	22.5	58.2	57.8	19.6	0,0009*
	Physical domain	57.6	60.8	32.5	74.4	82.5	21.6	0,0093*
	Mental domain	46.8	46.9	20.1	60.6	63.9	16.1	0,0001*
	Total quality of life	52.2	61.3	24.5	67.5	74.3	17.4	0,0004*
WHOQOL-BREF	Somatic domain	12.9	13.7	3.7	15.0	15.4	2.6	0,0026*
	Psychological domain	11.1	11.7	3.9	13.1	13.3	2.8	0,0027*
	Social domain	11.1	10.7	4.2	13.3	13.3	3.7	0,0071*
	Environment	13.1	13.8	3.2	14.8	15.0	2.0	0,0039*
GHQ-28	Somatic symptoms	2.9	2	2.5	1.7	1	2.2	0,0028*
	Anxiety, insomnia	3.1	3	2.7	1.5	0	2.1	0,0006*
	Social dysfunctions	2.4	1.5	2.5	0.9	0	1.7	0,0006*
	Depressive symptoms	1.8	1	2.3	0.6	0	1.2	0,0025*
	Total	10.1	7.5	9.0	4.5	1.5	6.0	0,0001*
BDI		16,5	10	16.5	9.4	6	10.2	0.0394*

BDI – Beck Depression Scale; **GHQ-28** – General Health Questionnaire; **SF-36** – Quality of Life Assessment Questionnaire; **WHOQOL-BREF** – World Health Organization Quality of Life; $\bar{x}$ – arithmetic mean; ***Me*** – median; ***SD*** – standard deviation; ***p*** – probability value.
* Statistically significant.

Tab. 10. Suicidal thoughts and SF-36, WHOQOL-BREF, GHQ-28 and BDI measures

Seeking support	**Suicidal thoughts after receiving HIV diagnosis ($p < 0.001$*)**			**Total**
	Suicide attempt	**Suicidal thoughts**	**None**	
Yes	5 (50.0%)	10 (33.3%)	5 (4.7%)	20
No	5 (50.0%)	20 (66.7%)	102 (95.3%)	127
Total	10	30	107	147

Tab. 11. Seeking support and suicidal thoughts/attempts

some SF-36 measures, while they were about 2–3 for the WHOQOL-BREF measures. Also, the level of self-reported mental health symptoms differed between the two compared groups. The GHQ-28 measures were significantly higher among those who had suicidal thoughts. Additionally, those who had suicidal thoughts showed higher severity of depressive symptoms measured with BDI (Tab. 10).

We also assessed the relationship between seeking support from others and suicidal thoughts or attempts after receiving HIV diagnosis. We found that the responses to the two questions were highly correlated ($p < 0.001$). Half of respondents who had made a suicide attempt sought support from others compared to one in three persons with suicidal thoughts. Respondents who did not show self-destructive tendencies very rarely sought support (<5%). Therefore, seeking help was a strong indication of potential suicidal behaviours, and these patients needed support (Tab. 11).

DISCUSSION

HIV diagnosis generally gives rise to severe anxiety, helplessness, guilt and depressive symptoms. Available research indicates that more than half of respondents considered the diagnosis of HIV infection to be the most stressful event they had ever experienced (Ogińska-Bulik, 2016). Post-traumatic stress disorder (PTSD) may be another negative consequence of the trauma associated with HIV diagnosis. The prevalence of PTSD among the seropositive population ranges from 5 to 74%, depending on the criteria and tools utilised (Sherr et al., 2011). Although the post-traumatic growth implies a higher level of functioning than before the trauma, it should not be identified with a sense of happiness, as positive changes are generally accompanied by distress and negative emotions (Sherr et al., 2011). Research has provided evidence for post-traumatic growth in HIV and AIDS patients. In their study in 60 people (including 30 HIV and 30 AIDS patients), Kossakowska and Zielazny (2013) analysed the following variables: subjective illness perception (e.g. sense of control over the illness, severity of symptoms), stress coping strategies, psychosocial benefits (e.g. seeking social support, change in life philosophy) and an independent variable – the type of condition (people living with HIV group, people living with AIDS group). The study showed that AIDS patients reported a significantly less favourable subjective illness perception than the HIV-positive group. This seems obvious given that conditions that are of little concern to healthy people can be fatal for AIDS patients, and the symptoms of the disease are very visible and problematic. In addition to poor prognosis, these patients very often experience psychological distress due to judgement, lack of social support or loneliness. However, both groups were similar in terms of their belief in the efficacy of treatment. Suicidal thoughts and attempts after receiving HIV diagnosis were reported by almost 30% and 7% of respondents, respectively. An extensive analysis of the frequency of suicide attempts among HIV-positive people on the African continent was conducted by Necho et al. (2021), who estimated the prevalence of suicidal thoughts among seropositive Africans at 21.7%. This is similar to the results obtained by Tsegay and Ayano (2020) in a meta-analysis of a total of 14 studies conducted among 4,842 young HIV patients, where a total of 22.3% of respondents confirmed experiencing suicidal thoughts. Carrieri et al. (2017) conducted their study among 2,973 people living with HIV in France to identify the main correlates of suicide risk in this patient group. The study was intended to help identify individuals who should and could benefit from suicide risk screening and psychiatric care. Finally, increased risk of suicidal thoughts and attempts was shown to be significantly associated with discrimination, loneliness, alcohol and drug abuse as well as low CD4 cell count (<200 cells/mm^3). Necho et al. (2021) and Tsegay and Ayano (2020) identified stigma, poor health, depression and poor social support as the main factors initiating or exacerbating suicidal thoughts. In their study, fear of living with HIV (23.1%) and fear of loneliness (15.6%) were reported as the most common reasons for suicidal thoughts. It can be seen that the experience of stigma, discrimination and fear of loneliness were common correlates for self-harming behaviour. Our findings on the percentage of individuals with suicidal thoughts (30%) and those who attempted suicide (7%) support the observations by Carrieri et al. (2017), clearly indicating the need to assess the mental state of people living with HIV. The research results cited above also have one common correlate of the discussed problem – the lack of social support. In our study, we analysed the association between seeking social support and the occurrence of suicidal thoughts or attempts after receiving HIV diagnosis. It was hypothesised that suicidal tendencies should prompt support-seeking. However, these two events could have also occurred in reverse order, i.e. the infected person could have sought support due to poor mental state, and suicidal thoughts occurred as a result of lack of support. Regardless of how these findings were interpreted, it can be concluded that the answers to the two questions considered were highly correlated ($p = 0.0000$). Half of those making a suicide attempt sought support from others. Among those with suicidal thoughts, support was sought by one in three respondents, and those with no self-destructive tendencies very rarely or never sought support (less than 5% of respondents in this group). It can be therefore concluded that seeking support can be a strong indication of potential suicidal tendencies, and HIV-positive patients with suicidal behaviours will need social support to a greater extent than other seropositive individuals. Suicidal thoughts/attempts have a clearly negative impact on the quality of life, as also confirmed in our study. Individuals who experienced suicidal thoughts were characterised by lower QoL in almost all SF-36 and WHOQOL-BREF categories. Differences between means were particularly evident in SF-36, reaching a score of even more than 30 for some measures. The most statistically significant differences between those who had suicidal thoughts and those who did not were found in the mental ($p = 0.0001$), social functioning ($p = 0.0002$) and wellbeing ($p = 0.0009$) domains. The overall quality of life in both groups was lower in the HIV-positive group with suicidal thoughts ($p = 0.0004$). Also, the level of symptoms related to mental health was different in the two compared groups. GHQ-28 scores were significantly higher among those who had suicidal thoughts. Patients with self-destructive tendencies scored higher for BDI depressive symptoms ($p = 0.0394$).

LIMITATIONS

Research on the quality of life in HIV-positive persons is a complex process that requires specialised knowledge, interpersonal skills and, above all, the maintenance of a high ethical level at every stage of the study. In order to make the above assessment as reliable as possible, it becomes necessary to study many aspects of life, including the intimate sphere, which is often an extremely difficult subject for HIV-positive patients. The assistance in completing the survey and questionnaires offered to patients was not met with respondents' approval. It should be emphasised that in order to maintain a high ethical standard, respondents were informed that they could withdraw from the study at any stage.

Analysing the research data, it was found that one or more questions, mainly related to the intimate sphere, were not answered. Given the very broad scope of the study, and therefore the necessity to complete an extensive survey and standardized questionnaires (SF-36, WHOQOL-BREF, GHQ-28, BDI), it can be assumed that some respondents may have consciously skipped selected questions. It can also be assumed that this may have resulted from accidental or deliberate omissions, due to the overly intimate nature of the questions or the voluminous nature of the questionnaire.

The questionnaires completed by the respondents were handed over to the medical staff (doctor, nurse) involved in the patient's therapy. Although each questionnaire was prepared in such a way that those receiving it from the patients did not have direct access to the contents (a sealed return envelope was used), it can be assumed that some respondents may have had concerns about whether the confidentiality principle applicable to the survey would actually be maintained. In the future, consideration should be given to providing a specially prepared and secured box for this purpose. It is also possible that some questions were incomprehensible to respondents. The place where the survey was completed may also have been the reason why some questions were left unanswered. Some respondents took the questionnaire home, while others did not for personal reasons. This group chose to complete the questionnaire either while at the doctor's appointment (in a specially prepared room) or in the patient room (the group being hospitalised). This could have been a reason for respondents to be distracted or to fill in the forms superficially, without deeper reflection, due to haste or impatience (having to return to work, home duties, or due to public transport schedules). Also, some of those who decided to take the questionnaire home did not return them. It must be assumed that they simply did not intend to take part in the survey. Therefore, the quality of life of patients treated in the Observation and Infection Clinic with the Subunit for HIV/AIDS Patients at the Teaching Hospital of the Medical University of Bialystok does not refer to the total group of seropositive individuals attending the Centre. In the future, it would be advisable to consider involving interviewers who would provide assistance in completing the questionnaires or using fewer survey tools.

CONCLUSIONS

One-third of the respondents reported symptoms of mood disorders, most of which were of moderate intensity, and one-fourth of the respondents had suicidal thoughts and attempts. The quality of life of HIV patients was mainly determined by their general physical and mental health and social support. A higher quality of life was presented by those with better general health status who received social support. Only marital status determinated the prevalence of symptoms of mood disorders in the study group.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organisations that could negatively affect the content of this publication and claim authorship rights to this publication.

Author contributions

Original concept of study: MMB, MC. Collection, recording and/or compilation of data: MMB, AB. Analysis and interpretation of data: MMB, MC, AB. Writing of manuscript: MMB, MC. Critical review of manuscript: MC, BK, MK, IPS. Final approval of manuscript: MMB, MC, AB, BK, MK, IPS.

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