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ORIGINAL ARTICLE

Adherence to antiretroviral therapy among people living with HIV at a specialized serology center

Adesão à terapia antirretroviral de pessoas vivendo com HIV em um centro de sorologia especializado

Adhesión a la terapia antirretroviral de personas que viven con HIV en un centro especializado de serología

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ABSTRACT:

Objective: To analyze the prevalence and factors influencing adherence to antiretroviral therapy among people living with HIV. **Methodology:** This was an exploratory, cross-sectional, and analytical study that collected sociodemographic, clinical, and structural data from people living with HIV between March and May 2023. Adherence to antiretroviral therapy was measured using the Brazilian version of the *Cuestionario para la Evaluación de la Adhesión al Tratamiento Antiretroviral*-CEAT-HIV questionnaire. **Results:** A total of 60 people living with HIV were interviewed, including 25 men and 35 women. According to the questionnaire, 78.3% of people living with the human immunodeficiency virus had insufficient adherence. Scores were influenced by medication shortages ($p = 0.031$), the intensity of adverse reactions ($p = 0.001$), and viral load ($p = 0.025$). **Conclusion:** The studied population of people living with HIV demonstrated low adherence to antiretroviral therapy due to clinical and structural factors.

DESCRIPTORS: HIV; Treatment Adherence and Compliance; Antiretroviral Therapy, Highly Active; Surveys and Questionnaires; Brazil.

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RESUMO:
Objetivo: Analisar a prevalência e fatores que influenciam a adesão à terapia antirretroviral em pessoas vivendo com HIV. **Metodologia:** Estudo exploratório, transversal e analítico, com coleta de dados sociodemográficos, clínicos e estruturais de pessoas vivendo com HIV, durante os meses de março a maio de 2023. A adesão à terapia antirretroviral foi medida através da versão brasileira do questionário *Cuestionario para la Evaluación de la Adhesión al Tratamiento Antiretroviral*-CEAT-VIH. **Resultados:** Foram entrevistadas 60 pessoas vivendo com HIV, sendo 25 homens e 35 mulheres. Segundo questionário, 78,3% das pessoas vivendo com o vírus da imunodeficiência humana tiveram adesão insuficiente. A pontuação foi influenciada pela falta de medicação (p = 0,031), intensidade das reações adversas (p = 0,001) e carga viral (p = 0,025). **Conclusão:** Pessoas vivendo com HIV estudadas tem baixa adesão à terapia antirretroviral devido a fatores clínicos e estruturais.

DESCRITORES: HIV; Adesão ao Tratamento; Terapia Antirretroviral; Questionário; Brasil.

RESUMEN:
Objetivo: Analizar la prevalencia y los factores que influyen en la adhesión a la terapia antirretroviral en personas que viven con VIH. **Metodología:** Estudio exploratorio, transversal y analítico, con recolección de datos sociodemográficos, clínicos y estructurales de personas que viven con VIH durante los meses de marzo a mayo de 2023. La adhesión a la terapia antirretroviral se midió a través de la versión brasileña del Cuestionario para la Evaluación de la Adhesión al Tratamiento Antirretroviral-CEAT-VIH. **Resultados:** Se entrevistaron a 60 personas que viven con VIH, de las cuales 25 eran hombres y 35 mujeres. Según el cuestionario, el 78,3% de las personas que viven con el virus de la inmunodeficiencia humana tuvieron adhesión insuficiente. La puntuación fue influenciada por la falta de medicamentos (p = 0,031), la intensidad de las reacciones adversas (p = 0,001) y la carga viral (p = 0,025). **Conclusión:** Las personas que viven con VIH estudiadas presentan una baja adhesión a la terapia antirretroviral debido a factores clínicos y estructurales.

DESCRIPTORES: VIH; Cumplimiento y Adherencia al Tratamiento; Terapia Antirretroviral altamente Activa; Encuestas y Cuestionarios; Brasil.

INTRODUCTION

There are currently around 38.4 million People Living with HIV (PLHIV) in the world, characterizing one of the largest epidemics in contemporary times. Since 1980, when the first case of HIV was recorded, this virus has infected approximately 82.4 million people who, due to progression to AIDS and associated diseases, have resulted in 40.1 million deaths. It is also evident that the majority of PLHIV are concentrated in sub-Saharan Africa (66%), followed by the Americas (10%) and Southeast Asia (10%), thus characterizing a problem for underdeveloped countries[1,2].

The Brazilian outlook is comparable to the global one, given that for every 100,000 people, 452 are living with HIV. Furthermore, since the beginning of the epidemic, Brazil has recorded 360,323 AIDS-related deaths. Geographically, cases are concentrated in the Southeast (43.3%), North (19.8%), and South (19.7%) of the country. Rio Grande do Sul has the highest rate of PLHIV in the South region[3].

Due to the lack of a cure for HIV, prevention methods are essential to control the disease. Therefore, to combat the epidemic, public awareness policies and mass testing are essential to prevent

the spread of the disease to other people. Although there is no cure, Antiretroviral Therapy (ART) has solved numerous problems caused by the disease, even preventing opportunistic infections and suppressing the Viral Load (VL) to the point of becoming a sexually non-contagious PLHIV[4]. However, for pharmacotherapeutic success, continuous and uninterrupted adherence to treatment is essential. Non-adherence to ART is directly related to virological failure, the acquisition of viral resistance, and the development of AIDS. Therefore, ensuring treatment adherence is essential for controlling the epidemic[5].

There are numerous barriers associated with adherence, especially in underdeveloped countries. Among them, the following stand out: structural (medication, transportation and lack of government support in remote locations), dosage (excess pills, difficulty swallowing), behavioral (forgetfulness, disorganization, lack of time, prejudices), psychological (depression, anxiety) and therapy-related (adverse effects). ART has evolved over the years, with new dosage regimens and new medications with fewer adverse reactions. Despite this, adherence is still a problem for the success of therapy among PLHIV[6].

Despite technological advances, it is still difficult to measure ART adherence due to its multifactorial complexity. To determine the ideal levels of pharmacotherapy adherence, it is necessary to use valid measurement methods. Self-report questionnaires associated with an external criterion, such as VL, are generally used[7]. By knowing the problems related to adherence, it is possible to take actions to correct them, contributing to achieving the 95-95-95 target sought by UNAIDS by 2030[1].

OBJECTIVE

To analyze the prevalence of adherence to ART among PLHIV in a serology center in the interior of the state of RS and identify the factors that influence adherence.

METHODOLOGY

An exploratory, cross-sectional, and analytical study was carried out, guided by the tool *Strengthening the Reporting of Observational Studies in Epidemiology* (STROBE)[8].

Study locus and period

The study was carried out at the Municipal Serology Service Center (*Centro Municipal de Atendimento à Sorologia*, CEMAS), Santa Cruz do Sul, Rio Grande do Sul, from March to May 2023.

Population and sample

Individuals over 18 years of age who had been using ART for at least six months participated in the study. The sample size was defined by convenience. All participants voluntarily consented by signing the Free and Informed Consent Form (FICF).

Inclusion and exclusion criteria

Individuals over 18 years of age who had been using ART continuously for at least six months were included in the study. Participants who could not provide consent or were unavailable to respond to the interview were excluded.

Study protocol

The study was conducted in 10 main stages:

1. Literature review on HIV.
2. Development of the research project.
3. Presentation of the project to the CEMAS team to obtain a letter of acceptance.
4. Submission of the project to the Research Ethics Committee (REC) of the University of Santa Cruz do Sul (UNISC).
5. The researcher collected data using two validated questionnaires, administered in person at CEMAS.
6. Access to medical records to supplement information.
7. Preparation of a spreadsheet with the data collected.
8. Processing and analyzing the results.
9. Describing and interpreting the results.
10. Writing the scientific article.

Data collection

The interview was conducted by a single, previously trained researcher in a private room. The interviews were standardized so that the researcher read out the questions and then the answers. In this way, the interviewee had to answer orally which of the answers fit their case. The answers were automatically recorded in the Google Forms application. The average interview time was 20 minutes.

The collection instrument consisted of two tools, the "*Cuestionario para la Evaluación de la Adhesión al Tratamiento Antiretroviral*" (CEAT-HIV) in its Brazilian version to measure adherence and a complementary questionnaire containing data with varied questions that will refer to the sociodemographic, behavioral, structural, clinical, and pharmacotherapeutic profile. Clinical data such as CD4+ count, VL, therapeutic changes, current pharmacological therapy, and treatment time were included in the supplementary questionnaire by the attending physician.

The Brazilian version of the CEAT-HIV questionnaire was used to measure adherence to ART. This questionnaire consists of a self-report multidimensional outcome tool to assess the degree of adherence based on 20 short, simple questions. It has an instruction manual for the researcher. The tool is available in seven different languages and has already been validated in Brazil[10-11].

CEAT-HIV addresses two spectrums of adherence, the first being adherence by PLHIV and the second the associated and critical factors of adherence, which include history of therapeutic abandonment, doctor-patient relationship, patient beliefs about the medication, intensity of side effects, level of information and knowledge about the medication, level of satisfaction with treatment, perception of improvement or worsening in health after starting treatment and the use of strategies to remember to take the medication. The result of this questionnaire is given by the total score (17 to 89), in which it is possible to verify the overall adherence to ART and classify it as good/adequate (greater than or equal to 85%), insufficient/with difficulty (between 84% and 50%) and insufficient/non-adherence (less than 49%)[10,11].

Analysis of the results and statistics

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25 for Windows®. Means, frequencies, and standard deviations (SD) were used to describe the data. The association between categorical variables was performed using Pearson's chi-square test, with a statistically significant relationship being considered when $p < 0.05$. In addition, Student's t-test was used for comparisons with the mean CEAT-HIV scores.

To check the reliability of the questionnaire, Cronbach's α was used to analyze internal consistency. The floor effect and ceiling effect were observed. These terms refer to the number of participants who achieved the minimum and maximum scores, respectively. If the value is greater than 20% of the population studied, the tool's scope for data collection is limited.

Ethical aspects

The research followed the ethical principles established by Resolution 466/2012 of the National Health Council. The project was approved by the Research Ethics Committee of UNISC and authorized by the Municipal Health Department of Santa Cruz do Sul. Participants were informed about the objectives, risks, and benefits of the research, and only participated after signing the FICF. Privacy and confidentiality of data were guaranteed, preserving the anonymity of the subjects. The information was stored at UNISC for five years and will subsequently be destroyed.

RESULTS

Sociodemographic, clinical and structural characteristics of study participants

Sixty PLHIV were assessed, 25 men (41.7%) and 35 women (58.3%), with a mean age of 46.28 ± 11.23 years. The majority declared themselves white (66.7%), followed by brown (26.7%) and black (4.7%). All the participants were literate, predominantly those with incomplete primary education (35.0%) and complete high school education (28.3%).

Regarding occupation, 48.3% were active in the labor market, 30.0% were unemployed and 21.7% were retired. Regarding key populations, 13.3% of men declared themselves to be homosexuals or men who have sex with men (MSM), 5.0% of women identified themselves as sex workers, and 6.7% reported being clients or sexual partners of key populations.

Table 1. Main sociodemographic characteristics of the study population according to gender, March – May 2023, Santa Cruz do Sul-RS, Brazil.

Sociodemographic characteristics		Total (n = 60)	Male n (%)	Female n (%)	*p* value
Gender	Male	25 (41.7)	-	-	-
	Female	35 (58.3)	-	-	
Age group	≤45	31 (51.7)	11 (44.0)	20 (57.1)	0.315
	>45	29 (48.3)	14 (56.0)	15 (42.9)	
Skin color	White	40 (66.7)	19 (76.0)	21 (60.0)	0.421
	Brown	16 (26.7)	5 (20.0)	11 (31.4)	
	Black	4 (4.7)	1 (4.0)	3 (8.6)	
	Asian	0 (0.0)	0 (0.0)	0 (0.0)	
	Indigenous	0 (0.0)	0 (0.0)	0 (0.0)	
Schooling	No studies	0 (0.0)	0 (0.0)	0 (0.0)	0.706
	Incomplete Elementary Education	21 (35.0)	7 (28.0)	14 (40.0)	
	Complete Elementary Education	7 (11.7)	3 (12.0)	4 (11.4)	
	Incomplete High School	5 (8.3)	3 (12.0)	2 (5.7)	
	Complete High School	17 (28.3)	6 (24.0)	11 (31.4)	
	Incomplete Higher Education	5 (8.3)	3 (12.0)	2 (5.7)	
	Complete Higher Education	5 (8.3)	3 (12.0)	2 (5.7)	
Work situation	Active	29 (48.3)	12 (48.0)	17 (48.6)	0.563
	Unemployed	18 (30.0)	9 (36.0)	9 (25.7)	
	Retired	13 (21.7)	4 (16.0)	9 (25.7)	
Key population	No	45 (75.0)	14 (56.0)	31 (88.6)	<0.01*
	Sex workers	3 (5.0)	0 (0.0)	3 (8.6)	
	Injecting drug users	0 (0.0)	0 (0.0)	0 (0.0)	
	Homosexual men	8 (13.3)	8 (32.0)	0 (0.0)	
	Transgender women	0 (0.0)	0 (0.0)	0 (0.0)	
	Sexual partners of key populations	4 (6.7)	3 (12.0)	1 (2.9)	

*p < 0.05 – Pearson's Chi-square test

The mean body mass index was 25.57 ± 4.94. Comorbidities were present in 60.0% of the sample, the most prevalent being depressive disorder (21.6%), considering only individuals using antidepressants. The majority (53.3%) did not use daily medications other than ART.

The average time since HIV diagnosis was 116.30 ± 82.90 months. Thirteen different therapeutic regimens were identified, the most frequent being the combination of lamivudine, tenofovir and dolutegravir (41.7%). The majority (53.3%) reported no ART-related side effects. Changes to the regimen occurred in 36.7% of cases, mainly due to adverse effects.

Viral load (VL) was undetectable in 78.3% of patients; 6.7% had a CD4+ count below 200 cells/mm³, with an overall mean of 701.57 ± 420.74 cells/mm³. Regarding structural barriers, 8.3% reported lack of medication, and 1.6% lack of information provided by the service.

Table 2. Main clinical characteristics of the study population according to gender, March – May 2023, Santa Cruz do Sul-RS, Brazil.

Clinical characteristics		**Total (n = 60)**	**Male n %**	**Female n %**	***p* value***
BMI	<18.5	2 (3.3)	1 (4.0)	1 (2.9)	0.376
	18.5 – 24.9	24 (40.0)	9 (36.0)	15 (42.9)	
	25.0 – 29.9	22 (36.7)	12 (48.0)	10 (28.6)	
	>30	12 (20.0)	3 (12.9)	9 (25.7)	
Comorbidities	None	24 (40.0)	10 (40.0)	14 (40.0)	0.812
	One	16 (26.7)	6 (24.0)	10 (28.6)	
	Two	9 (15.0)	5 (20.0)	4 (11.4)	
	Three or more	11 (18.3)	4 (16.0)	7 (20.0)	
Depression	No	47 (78.3)	5 (20.0)	8 (22.9)	0.791
	Yes	13 (21.7)	20 (80.0)	27 (77.1)	
Number of medications per day (in addition to ART)	None	32 (53.3)	13 (52.0)	19 (54.3)	0.702
	1	12 (20.0)	6 (24.0)	6 (17.1)	
	2 – 3	5 (8.3)	1 (4.0)	4 (11.4)	
	4 – 5	6 (10.0)	2 (8.0)	4 (11.4)	
	6+	5 (8.3)	3 (12.0)	2 (5.7)	
Time living with HIV (months)	≤24	8 (13.3)	3 (12.0)	5 (14.3)	0.911
	25 – 72	15 (25.0)	8 (32.0)	7 (20.0)	
	73 – 120	14 (23.3)	5 (20.0)	9 (25.7)	
	>120	23 (38.3)	9 (36.0)	14 (40.0)	
Therapeutic regimen	3TC + TDF + DTG	25 (41.7)	11 (44.0)	14 (56.0)	0.216
	3TC + TDF + ATZ + RTV	12 (20.0)	3 (12.0)	5 (14.3)	
	3TC + TDF + EFV	8 (13.3)	2 (8.0)	10 (28.6)	
	3TC + DTG	4 (6.7)	3 (12.0)	1 (2.9)	
	Others	11 (18.3)	6 (24.0)	5 (14.3)	

Composition of ART	1 pill	12 (20.0)	6 (24.0)	6 (17.1)	0.920
	2 pills	27 (45.0)	11 (44.0)	16 (45.7)	
	3 pills	18 (30.0)	7 (28.0)	11 (31.4)	
	4 pills	3 (5.0)	1 (4.0)	2 (5.7)	
Intensity of side effects	Not at all intense	32 (53.3)	11 (44.0)	21 (53.3)	0.330
	Slightly intense	11 (18.3)	4 (16.0)	7 (20.0)	
	Mediumly intense	10 (16.7)	5 (20.0)	5 (14.3)	
	Intense	5 (8.3)	3 (12.0)	2 (5.7)	
	Very intense	2 (3.3)	2 (8.0)	0 (0.0)	
Knowledge of serological status	No	10 (16.7)	4 (16.0)	6 (17.1)	0.955
	Undetectable	42 (70.0)	18 (72.0)	24 (68.6)	
	Detectable	8 (13.3)	3 (12.0)	5 (14.3)	
Viral load	Undetectable	47 (78.3)	20 (80.0)	27 (77.1)	0.962
	≤1000	8 (13.3)	3 (12.0)	5 (14.3)	
	>1000	5 (8.3)	2 (8.0)	3 (8.6)	
CD4+ count	<200/mm^3	4 (6.7)	2 (8.0)	2 (5.7)	0.095
	201 – 500/mm^3	20 (33.3)	12 (48.0)	8 (22.9)	
	>501/mm^3	36 (60.0)	11 (44.0)	25 (71.4)	
Therapeutic change due to adverse effects	No	38 (63.3)	16 (64.0)	22 (63.3)	0.928
	Yes	22 (36.7)	9 (36.0)	13 (37.1)	
Therapeutic change due to pharmacological ineffectiveness	No	55 (91.7)	22 (88.0)	33 (94.3)	0.385
	Yes	5 (8.3)	3 (12.0)	2 (5.7)	
Do you use any strategies to remember to take ART?	No	36 (60.0)	17 (68.0)	19 (54.29)	0.061
	Visible place	9 (15.0)	1 (4.0)	8 (22.86)	
	Alarm	6 (10.0)	4 (16.0)	2 (5.71)	
	Pill organizer	5 (8.3)	3 (12.0)	2 (5.71)	
	Other	4 (6.7)	0 (0.0)	4 (11.43)	

*Pearson's chi-square

Level of adherence to ART according to CEAT-HIV

The mean CEAT-HIV score was 75.80 ± 5.25 (minimum: 58; maximum: 84). The majority were classified as having insufficient/difficult adherence (46.7%) or non-adherence (31.7%), while only 21.7% had adequate adherence.

A negative correlation was observed between the intensity of side effects and the CEAT-HIV score ($r = –0.435$; $p = 0.001$), indicating that greater side effects reduce adherence. A correlation was also identified with detectable VL ($r = –0.289$; $p = 0.025$) and with the absence of medication in the last six months ($r = –0.278$; $p = 0.031$), demonstrating a direct impact on adherence.

Table 3. Level of adherence to antiretroviral therapy related to sociodemographic, clinical, and structural characteristics of the study population, March – May 2023, Santa Cruz do Sul-RS, Brazil.

Individual characteristics	Variables	CEAT-HIV	SD	*p* value*
Sociodemographic characteristics				
Gender	Male	76.24	5.35	0.558
	Female	75.49	5.23	
Age group	≤45	76.19	4.78	0.553
	>45	75.38	5.77	
Skin color	White	76.55	4.87	0.213
	Brown	74.88	5.71	
	Black	72.00	6.27	
Schooling	Incomplete Elementary Education	74.90	5.54	0.263
	Complete Elementary Education	77.14	6.15	
	Incomplete High School	76.80	2.28	
	Complete High School	74.59	5.57	
	Incomplete Higher Education	76.80	4.55	
	Complete Higher Education	79.80	3.19	
Work situation	Employed	77.10	4.12	0.759
	Unemployed	75.00	5.27	
	Retired	74.00	6.93	
Key population	No	75.36	5.60	0.457
	Sex workers	78.33	2.08	
	Homosexual man	77.25	4.83	
	Sexual partners of key populations	76.00	3.16	
Clinical characteristics				
BMI	<18.5	75.00	2.83	0.747
	18.5 – 24.9	74.87	6.54	
	25.0 – 29.9	77.55	4.04	
	>30	74.58	4.08	
Comorbidities	None	76.75	4.49	0.078
	One	75.94	5.47	
	Two	76.67	3.61	
	Three or more	72.82	6.94	
Depression	No	75.72	5.72	0.832
	Yes	76.08	3.17	
Number of medications per day (in addition to ART)	None	76.03	5.15	0.661
	1	77.00	4.47	
	2 – 3	71.00	7.52	
	4 – 5	75.67	6.38	
	6+	76.40	2.19	
Time living with HIV	≤24 months	77.63	2.97	0.139
	25 – 72 months	77.43	5.24	
	73 – 120 months	74.13	6.48	
	>120 months	75.26	4.80	

Therapeutic regimen	3TC + TDF + DTG	76.32	4.26	0.341
	3TC + TDF + ATZ + RTV	73.92	4.52	
	3TC + TDF + EFV	77.88	2.85	
	3TC + DTG	76.50	12.48	
	Others	74.91	5.89	
Composition of ART	1 pill	77.42	6.89	0.112
	2 pills	76.44	4.26	
	3 pills	73.56	5.27	
	4 pills	77.00	2.65	
Intensity of side effects	Not at all intense	77.63	4.84	0.001*
	Slightly intense	75.00	5.29	
	Mediumly intense	73.90	4.86	
	Intense	73.20	3.56	
	Very intense	67.00	4.24	
Knowledge of serological status	No	75.20	4.76	0.331
	Undetectable	76.38	5.25	
	Detectable	73.50	5.73	
Viral load	Undetectable	76.54	4.93	0.025*
	≤1000	74.13	5.64	
	>1000	71.60	7.07	
$CD4^+$ count	<200/mm^3	74.25	7.45	0.894
	201 – 500/mm^3	76.25	6.36	
	>501/mm^3	75.72	4.39	
Therapeutic change due to adverse effects	No	76.16	4.99	0.492
	Yes	75.18	5.73	
Therapeutic change due to pharmacological ineffectiveness	No	76.09	6.58	0.156
	Yes	72.60	5.08	
Do you use any strategies to remember to take ART?	No	75.44	5.23	0.519
	Visible place	76.33	3.94	
	Alarm	76.67	4.08	
	Pill organizer	78.00	3.39	
	Other	73.75	11.00	
Structural characteristics				
Have you stopped receiving your medication in the last six months?	No	76.24	4.45	0.031*
	Yes	71.00	10.37	
Is there sufficient information about treatment?	No	77.00	-	0.820
	Yes	75.78	5.29	

*Pearson's chi-square.

Validation of CEAT-HIV in the study population

An overall Cronbach's α of 0.72 was obtained to analyze the internal consistency of the questionnaire, Four items were excluded because they had zero variance. There was no floor effect (0%) or ceiling effect (0%), since no participant reached the maximum or minimum score (17 and 89, respectively).

DISCUSSION

Of the 60 PLHIV evaluated, only 21.7% had good/adequate adherence to ART, while 78.3% had insufficient or no adherence, according to the CEAT-HIV (mean score: 75.80 ± 5.25; minimum: 58; maximum: 84. Factors associated with poor adherence included greater intensity of side effects ($r = -0.435$; $p = 0.001$), failure to receive medication ($r = -0.278$; $p = 0.031$) and detectable viral load (VL) ($r = -0.289$; $p = 0.025$).

The study population included 25 men (41.7%) and 35 women (58.3%), with an average age of 46.28 ± 11.23 years. The majority declared themselves white (66.7%), followed by brown (26.7%) and black (4.7%). All the participants were literate, predominating incomplete primary education (35.0%) and complete high school education (28.3%). Regarding occupation, 48.3% were working, 30.0% unemployed, and 21.7% retired. Gender, age, skin color, and educational level were not significantly related to adherence, unlike some studies[12-14]. Socioeconomic variables, such as occupation and income, also did not influence adherence, contrasting with research in contexts of extreme poverty, but corroborating other findings[11-12,15-16].

Around 25% of PLHIV belonged to key populations: homosexual men (13.3%), sex workers (5.0%), and sexual partners of key populations (6.7%). Globally, these populations represent 5% of PLHIV but accounted for 70% of new HIV infections in 2021[1-2].

Among the clinical characteristics, the average body mass index was 25.57 ± 4.94, with 56.7% of PLHIV classified as overweight or obese, possibly due to medication such as dolutegravir. Comorbidities, such as depressive disorder (21.6%), did not correlate with adherence, in contrast to studies that associate depression with low adherence[15,17-19]. The majority (53.3%) did not use any medication besides ART, and simple regimens (1-2 pills/day) predominated (65.0%), but did not impact adherence[20]. The average time to diagnosis was 116.30 ± 82.90 months, higher than in other studies (81.60, 42.25, and 71.00 months)[10,12,16].

The intensity of side effects was a determining factor, with 53.3% of PLHIV without side effects reporting better CEAT-HIV scores, consistent with the literature[21-23]. Changes in the therapeutic regimen, reported by 36.7% due to adverse effects, reinforce the need for clinical monitoring. The mean CD4+ T-lymphocyte count (701.57 ± 420.74 cells/mm³) was higher than in other studies, but did not predict adherence, suggesting that this marker is not reliable for assessing adherence[10-12,16,19,21-22].

Strategies reported by PLHIV, such as storing medication in visible places, using alarms, pill organizers, and associating taking medication with daily routines, are recommended to overcome behavioral barriers, such as forgetfulness[6,7]. To improve adherence, interventions such as health education, individualized counseling, and digital reminders could be implemented, especially considering local structural barriers, such as not receiving medication (8,3%)[3,7].

Structural barriers, including lack of medication (8.3%) and insufficient information (1.6%), negatively impacted adherence, in line with studies that highlight access and availability of services as crucial factors[7,25]. Undetectable VL, achieved by 78.3% of PLHIV, indicates therapeutic success, but the potency of modern ART allows viral suppression with adherence of 80-85%, requiring caution when associating it with strict adherence[10,11,13,16,26-29]. Compared to similar studies (59.3% and 68.3% viral suppression), the result is positive(11.15). However, the region falls short of the UNAIDS 95-95-95 target, which aims for 95% of PLHIV on ART with undetectable VL by 2030. In 2021, 92% of PLHIV on ART globally achieved viral suppression, indicating the need for local progress[1-2].

The CEAT-HIV showed reliability (Cronbach's α = 0.72), with no floor or ceiling effects, reinforcing its validity for assessing adherence[10-11,13-14,16,27,30]. The significant relationship between its score and undetectable VL validates its use. However, the stagnation in adherence levels (similar to studies from 2007) suggests the need for public policies to mitigate clinical (side effects) and structural (access to medication) barriers to improve ART adherence.

Study limitations

It is essential to consider the potential limitations of this study. Given that the research involved patients from a single serology clinic, it is important to recognize that the results may not fully reflect ART adherence in the region in question, especially among PLHIV who do not have access to this type of health service. In addition, it is important to note that the questionnaire used was based on participants' self-reporting, which may be subject to response bias and therefore influence the accuracy of the information collected.

Contributions to the Area of Nursing, Health, or Public Policy

This study contributes to Nursing, Health, and Public Policy by identifying factors that negatively influence ART adherence, such as intensity of side effects, non-receipt of medication, and detectable VL, as well as validating the CEAT-HIV as a useful tool for monitoring adherence. It reinforces the importance of personalized interventions by nurses, such as educational support and management of structural and behavioral barriers, promoting patient-centered care. In addition, it highlights the need for public policies that guarantee the regular availability of medicines, expand access to key populations, and strengthen strategies to achieve global viral suppression targets, such as the UN's 95-95-95.

CONCLUSION

This study analyzed the prevalence of ART adherence among PLHIV treated at a serology center in the interior of Rio Grande do Sul, identifying that only 21.7% had good or adequate adherence, while 78.3% had insufficient adherence. Factors related to low adherence include the intensity of side effects, not receiving medication regularly, and detectable VL, highlighting the importance of strategies aimed at managing adverse effects, ensuring continuous access to medication, and regular clinical follow-up. The prevalence of undetectable VL (78.3%) in the study population, although significant, is still below global viral suppression targets such as 95-95-95, highlighting the need for advances in public policies and educational actions to improve adherence. Finally, it is concluded that the use of CEAT-HIV is a reliable tool for monitoring adherence to ART, and that coordinated efforts involving health professionals, especially nurses, and public managers are essential to mitigate the challenges identified and promote better outcomes in the care of PLHIV.

REFERENCES

1. UNAIDS. Global AIDS Update [Internet]. 2022 [citado 15 out 2024]. Disponível em: https://unaids.org.br/tag/global-aids-update/.

2. WHO. Key facts HIV [Internet]. World Health Organization. 2022 [citado 23 nov 2024]. Disponível em: https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/hiv-programme.

3. Brasil. Boletim Epidemiológico HIV / AIDS | 2021 [Internet]. 2021 [citado 10 out 2024]. Disponível em: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/especiais/2021/boletim-epidemiologico-especial-hiv-aids-2021.pdf/view.

4. Ghosn J, Taiwo B, Seedat S, Autran B, Katlama C. HIV (Seminar Lancet 2018). Lancet. 2018 [citado 28 nov 2024];392(10148):685–97. Disponível em: https://doi.org/10.1016/s0140-6736(18)31311-4.

5. Cavanaugh C, Ward K. HIV/STI Prevention Interventions for Women Who Have Experienced Intimate Partner Violence: A Systematic Review and Look at Whether the Interventions Were Designed for Disseminations. AIDS Behav [Internet]. 2021 [citado 17 out 2024];25(11):3605–16. Disponível em: https://doi.org/10.1007/s10461-021-03318-5.

6. Kalichman SC, Kalichman MO, Cherry C. Forget About Forgetting: Structural Barriers and Severe Non-Adherence to Antiretroviral Therapy. AIDS Care. 2017 [citado 05 nov 2024];29(4):418–22. Disponível em: https://doi.org/10.1080/09540121.2016.1220478.

7. Croome N, Ahluwalia M, Hughes LD, Abas M. Patient-reported barriers and facilitators to antiretroviral adherence in sub-Saharan Africa. AIDS. 2017 [citado 12 out 2024];31(7):995–1007. Disponível em: https://doi.org/10.1097/qad.0000000000001416.

8. Von Elm E, Altman DG, Egger M, Gøtzsche PC, Vandenbroucke JP, for the STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol. 2008 [citado 19 nov 2024];61(4):344–9. Disponível em: https://doi.org/10.1016/j.jclinepi.2007.11.008.

9. IBGE. Santa Cruz do Sul [Internet]. gov.br. 2022 [citado 30 out 2024]. p. 1–3. Disponível em: https://www.ibge.gov.br/cidades-e-estados/rs/santa-cruz-do-sul.html.

10. Remor E. Valoración de la adhesión al tratamiento antirretroviral en pacientes VIH+. Psicothema [Internet]. 2002 [citado 07 nov 2024];14(2):262–7. Disponível em: http://www.scopus.com/inward/record.url?eid=2-s2.0-0036347257&partnerID=MN8TOARS.

11. Remor E, Milner-Moskovics J, Preussler G. Adaptação brasileira do "Cuestionario para la Evaluación de la Adhesión al Tratamiento Antiretroviral." Rev Saude Publica. 2007 [citado 25 out 2024];41(5):685–94. Disponível em: https://doi.org/10.1590/S0034-89102006005000043.

12. Salmanton-García J, Herrador Z, Ruiz-Seco P, Nzang-Esono J, Bendomo V, Bashmakovic E, et al. Self-reported adherence to antiretroviral therapy in HIV+ population from Bata, Equatorial Guinea. AIDS Care - Psychol Socio-Medical Asp AIDS/HIV. 2016 [citado 14 nov 2024];28(5):543–53. Disponível em: https://doi.org/10.1080/09540121.2015.1124976.

13. Casotti JAS, Mendes AAS, Endlich BN, Queiroz MD. Factors Associated with Adherence to HAART in Patients with HIV/Aids. J Bras Doenças Sex Transm. 2011 [citado 02 out 2024];23(4):215–21. Disponível em: https://bdst.emnuvens.com.br/revista/article/view/1027.

14. Remor E. Adherence to ARV medication in Romanian young adults: Self-reported behaviour and psychological barriers. Psychol Heal Med. 2013 [citado 21 nov 2024];18(3):343–54. Disponível em: https://doi.org/10.1080/13548506.2012.722648.

15. Calvetti PÜ, Giovelli GRM, Gauer GJC, Moraes JFD de. Psychosocial factors associated with adherence to treatment and quality of life in people living with HIV/AIDS in Brazil. J Bras Psiquiatr. 2014 [citado 09 out 2024];63(1):8–15. Disponível em: https://doi.org/10.1590/0047-2085000000002.

16. Carvalho CV de, Merchán-Hamann E, Matsushita R. Determinantes da adesão ao tratamento anti-retroviral em Brasília, DF: um estudo de caso-controle. Rev Soc Bras Med Trop. 2007 [citado 16 nov 2024];40(5):555–65. Disponível em: https://doi.org/10.1590/S0037-86822007000500013.

17. Sax PE, Erlandson KM, Lake JE, McComsey GA, Orkin C, Esser S, et al. Weight gain following initiation of antiretroviral therapy: Risk factors in randomized comparative clinical trials. Clin Infect Dis. 2020 [citado 27 out 2024];71(6):1379–89. Disponível em: https://doi.org/10.1093/cid/ciz999.

18. Abebe W, Gebremariam M, Molla M, Teferra S, Wissow L, Ruff A. Prevalence of depression among HIV-positive pregnant women and its association with adherence to antiretroviral therapy in Addis Ababa,

Ethiopia. PLoS One [Internet]. 2022 [citado 04 nov 2024];17(1):1–13. Disponível em: http://dx.doi.org/10.1371/journal.pone.0262638.

19. Camargo CC, Cavassan NRV, Tasca KI, Meneguin S, Miot HA, Souza LR. Depression and coping are associated with failure of adherence to antiretroviral therapy among people living with HIV/aids. AIDS Res Hum Retroviruses. 2019 [citado 11 out 2024];35(11–12):1181–8. Disponível em: https://doi.org/10.1089/aid.2019.0050.

20. Young J, Smith C, Teira R, Reiss P, Jarrín Vera I, Crane H, et al. Antiretroviral pill count and clinical outcomes in treatment-naïve patients with HIV infection. HIV Med. 2018 [citado 18 nov 2024];19(2):132–42. Disponível em: https://doi.org/10.1111/hiv.12562.

21. Miyada S, Garbin AJÍ, Gatto RCJ, Garbin CAS. Treatment adherence in patients living with HIV/AIDS assisted at a specialized facility in Brazil. Rev Soc Bras Med Trop. 2017 [citado 13 out 2024];50(5):607–12. Disponível em: https://doi.org/10.1590/0037-8682-0266-2017.

22. Reis ACRDS, Guerra MNP, Lencastre LMDFQE. Treatment adherence and subjective well-being in HIV/AIDS infection. AIDS Care - Psychol Socio-Medical Asp AIDS/HIV. 2013 [citado 29 nov 2024];25(12):1604–11. Disponível em: https://doi.org/10.1080/09540121.2013.793276.

23. Carey JW, Carnes N, Schoua-Glusberg A, Kenward K, Gelaude D, Denson DJ, et al. Barriers and facilitators for antiretroviral treatment adherence among HIV-positive African American and latino men who have sex with men. AIDS Educ Prev. 2019 [citado 08 nov 2024];31(4):306–24. Disponível em: https://doi.org/10.1521/aeap.2019.31.4.306.

24. Sigaloff KCE, Hamers RL, Menke J, Labib M, Siwale M, Ive P, et al. Early warning indicators for population-based monitoring of HIV drug resistance in 6 African countries. Clin Infect Dis. 2012 [citado 20 out 2024];54(SUPPL. 4. Disponível em: https://doi.org/10.1093/cid/cir1015.

25. Fernandez SB, Lopez C, Ibarra C, Sheehan DM, Ladner RA, Trepka MJ. Examining Barriers to Medication Adherence and Retention in Care among Women Living with HIV in the Face of Homelessness and Unstable Housing. Int J Environ Res Public Health [Internet]. 2022 [citado 06 nov 2024];19(18). Disponível em: https://doi.org/10.3390/ijerph191811484.

26. Cohen MS, McCauley M, Gamble TR. HIV treatment as prevention and HPTN 052. Curr Opin HIV AIDS. 2012 [citado 26 out 2024];7(2):99–105. Disponível em: https://doi.org/10.1097/coh.0b013e32834f5cf2.

27. Reis AC, Lencastre L, Guerra MP, Remor E. Adaptação portuguesa do questionário para a avaliação da adesão ao tratamento anti-retrovírico–VIH (CEAT-VIH). Psicol Saúde e Doenças. 2009 [citado 03 nov 2024];10(2):175–91. Disponível em: https://doi.org/10.1590/S0034-89102006005000043.

28. Bangsberg DR, Hecht FM, Charlebois ED, Zolopa AR, Holodniy M, Sheiner L, et al. Adherence to protease inhibitors, HIV-1 viral load, and development of drug resistance in an indigent population. AIDS.

2000 [citado 22 nov 2024];14(4):357–66. Disponível em: https://doi.org/10.1097/00002030-200003100-00008.

29. Viswanathan S, Detels R, Mehta SH, Macatangay BJC. Level of adherence and HIV RNA suppression in the current era of Highly Active Antiretroviral Therapy (HAART). AIDS Behav. 2015 [citado 01 out 2024];19(4):1–18. Disponível em: https://doi.org/10.1007/s10461-014-0927-4.

30. Foresto JS, Melo ES, Costa CRB, Antonini M, Gir E, Reis RK. Adesão à terapêutica antirretroviral de pessoas vivendo com HIV/aids em um município do interior paulista. Rev Gaúcha Enferm. 2017 [citado 24 nov 2024];38(1):1–7. Disponível em: https://doi.org/10.1590/1983-1447.2017.01.63158.

31. Primeira MR, Santos ÉEP dos, Züge SS, Magnago TSB de S, Paula CC de, Padoin SM de M. Avaliação Da Adesão Ao Tratamento Antirretroviral De Pessoas Vivendo Com Hiv. Saúde e Pesqui. 2018 [citado 31 out 2024];11(2):307. Disponível em: https://doi.org/10.17765/1983-1870.2018v11n2p307-314.

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