




Alcohol consumption in people living with HIV and its implications for clinical outcomes

Consumo de álcool em pessoas vivendo com HIV e suas implicações para os desfechos clínicos

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ABSTRACT

This study aimed to analyze the prevalence of alcohol consumption among people living with HIV and its association with clinical outcomes. It is an analytical, cross-sectional study, carried out with people living with HIV in outpatient treatment in the municipality of Ribeirão Preto, SP. An interview was carried out using a sociodemographic instrument, a clinical instrument, and the *Cuestionario para La Evaluación de La Adhesión al Tratamiento Antirretroviral* (Assessment of Adherence to Antiretroviral Therapy Questionnaire). Chi-squared test, Fisher's Exact test, and logistical regression, adopting $p < 0.05$, were used for data analysis. Of the 340 participants, the prevalence of alcohol consumption was 40.6%, of whom 35% presented low to moderate consumption and 5.6% high consumption. It was identified that people with detectable viral load have 1.76 times more chance of consuming alcohol ($p = 0.04$; 95%CI 1.00–3.05). The study showed a high prevalence of alcohol consumption among people living with HIV and the clinical outcome presenting an association with high consumption was viral load.

Descriptors: HIV; Viral Load; Medication Adherence; Nursing.

RESUMO

Objetivou-se analisar a prevalência do consumo de álcool em pessoas vivendo com HIV e sua associação com os desfechos clínicos. Trata-se de um estudo transversal, analítico, realizado com pessoas que vivem com HIV em tratamento ambulatorial no município de Ribeirão Preto, SP. Realizou-se entrevista com instrumento sociodemográfico e clínico e com o *Cuestionario para La Evaluación de La Adhesión al Tratamiento Antirretroviral*. Para análise dos dados utilizou-se os Testes Qui-quadrado, Exato de Fisher e regressão logística, adotando $p < 0,05$. Dos 340 participantes, a prevalência do consumo de álcool foi 40,6%, dos quais 35% apresentavam consumo leve e moderado e 5,6% alto. Identificou-se que pessoas com carga viral detectável tem 1,76 vezes mais chance ($p = 0,04$; IC95% 1,00–3,05) de consumir álcool. O estudo evidenciou uma alta prevalência de consumo de álcool entre pessoas que vivem com HIV e o desfecho clínico que apresentou associação com o alto consumo de álcool foi a carga viral.

Descritores: HIV; Carga Viral; Adesão à Medicação; Enfermagem.

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INTRODUCTION

Currently, people living with HIV (PLWH) present a greater prevalence and a higher frequency of psychiatric disorders, particularly the consumption of psychoactive substances⁽¹⁾.

Alcohol is the most commonly used psychoactive substance and is associated with high-risk sexual behaviors, influencing people's behavior, and conferring greater vulnerability to the occurrence of sexually transmitted infections (STI), including HIV⁽²⁾. Studies show that alcohol consumption among PLWH is high and is possibly double that of the general population⁽³⁾.

The American Center for Research on Alcohol in HIV recommends that PLWH minimize or totally abstain from consuming alcoholic beverages, since their consumption impedes infection control, due to the reduction in TCD4+ lymphocyte counts, reduced adherence to medication, and, consequently, suppression of the viral load^(4,5). Moreover, alcohol consumption can increase the risk of individuals becoming resistant to Antiretroviral Therapy (ARVT)⁽⁶⁾.

Other studies also state that PLWH use alcohol to relieve stress, given that it can calm their mental state, making it easier to cope with the stigma and prejudice arising from HIV infection⁽³⁾.

The World Health Organization warns that alcohol consumption becomes a disorder when the individual presents difficulty controlling consumption, is worried about alcohol, continues drinking even when it causes the individual a problem, begins ingesting greater quantities to obtain an effect, or begins feeling withdrawal symptoms when suddenly reducing how much they drink⁽⁷⁾.

Therefore, evaluation of alcohol consumption is of clinical importance and represents a public health problem, especially in more vulnerable populations, such as PLWH⁽³⁾. In Brazil, studies on the topic are scarce, especially in relation to prevalence, profiling of alcohol consumption, and its implication in adherence to treatment, TCD4+ cell counts, viral load, and other specific clinical characteristics of HIV infection.

Thus, this study aims to analyze the prevalence of alcohol consumption in people living with HIV and its association with clinical outcomes.

METHODS

This is an analytical, cross-sectional study carried out at outpatient clinics of the Specialized Treatment Service (SAE) attending people living with HIV in the municipality of Ribeirão Preto, SP, in the period from March 2014 to October 2016. The outpatient clinics represent the five healthcare districts of the municipality of Ribeirão Preto, SP and are part of the Unified Health System (SUS).

Initially, sample calculation was conducted, which was based on the number of individuals using ARVT treated at the reference services of the studied municipality. The following formula was used to calculate sample size: $n = \frac{Z\alpha^2 \cdot (P \cdot Q)}{d^2}$, where n is the sample size, Z is the variable reduced to one, $\alpha = 5\%$, $P = 50\%$, and a precision level $d = 5\%$. Correction for a finite population was made, which resulted in a sample size of 340. Sampling was not probabilistic, that is, the participants were recruited as they appeared for treatment.

Included in the study were individuals aged over 18 who were knowingly HIV positive and had been using ARVT for at least six months. Those in situations of confinement such as prisoners, the institutionalized, care home residents, and pregnant women were excluded from the study. A total of 374 people were recruited until the intended sample was reached.

Data were collected through individual interviews in rooms at the outpatient clinic, before or after the doctor's or nursing appointment, by the researchers and trained research assistants. This training aimed to reduce the risk of bias in application of the instrument and guide the interviewers' procedures, as well as avoid misinterpretations or inconsistencies that could compromise the results. Thus, on arriving at the clinic, the individuals were invited to participate in the study and informed of the research aim. At this moment, the participants read the Informed Consent Form (TCLE), which was then signed by those interested in taking part.

After signing the TCLE, information collection occurred in two stages. The first was the interview, in which the patients were questioned on sociodemographic and clinical data, for a duration of around 30 to 40 minutes. The interview happened once and was not recorded. Soon after, clinical information was collected from the patient's records referring to the amount of time since HIV diagnosis, time using ARVT, and the last laboratory examinations of TCD4+ cell counts and viral load.

A semi-structured profiling instrument was constructed specifically for the study, containing the following variables: sociodemographic – sex (male/female), age (in complete years), education (complete years of study); and specific clinical data related to HIV infection - time since diagnosis (calculated through the difference between the interview date and the date of medical diagnosis of infection), time using ARVT (calculated through the difference between the interview date and the date the medical treatment began), TCD4+ cell count and viral load (through the last laboratory examinations contained in the patient's records, and within the maximum period of a year).

The use of alcohol was self-reported and consumption (yes/no) and weekly frequency (once, twice, three times, or more than three times) were evaluated. For the analysis of consumption, a classification of low/moderate was adopted for those that drank once to three times a week, and high was adopted for those using

alcohol more than three times a week. The parameters were based on the cutoff point of international studies evaluating alcohol consumption in people living with HIV^(5,8).

The variables representing the clinical indicators related to HIV infection, such as the TCD4+ lymphocytes count, viral load and adherence to antiretroviral therapy were considered clinical outcomes.

To assess adherence to antiretroviral therapy, the *Cuestionario para La Evaluación de La Adhesión al Tratamiento Antirretroviral* (Assessment of Adherence to Antiretroviral Therapy Questionnaire) (CEAT-VIH) was used in the version validated for Brazil⁽⁹⁾.

This instrument has been validated in various countries, with different languages and cultures, including in Brazil with adults, youths, and the elderly. It has proven to be a useful tool that is a valid and reliable measure of adherence to HIV treatment among samples of different sex, age, socioeconomic level, and education in a wide variety of studied populations⁽⁸⁾.

The CEAT-VIH is a Likert scale with 20 items, varying from one to five, evaluating the degree of adherence to antiretroviral treatment. The higher the score, the greater the adherence to treatment⁽⁹⁾. For analysis, the scores were classified into two groups of good/strict adherence (total score ≥ 75) and low/insufficient adherence (total score ≤ 74)⁽¹⁰⁾.

Descriptive statistics were used for sociodemographic and clinical profiling of the sample. The association between alcohol consumption and clinical outcomes was tested using Chi-squared and Fisher's Exact tests. Variables presenting a value of $p < 0.05$ were considered significant.

A logistical regression analysis was used to evaluate the influence of the clinical outcome variables on alcohol consumption. Stepwise was used to select the independent variables, using Akaike Information Criteria (AIC). With the intention of evaluating the possibility of including another variable, the Likelihood Ratio test was used to compare the complete model (all the variables) and the simplified model (variables chosen using AIC).

The Odds Ratio (OR) for each of the present variables was calculated from the chosen model. All analyses were carried out considering a 5% level of significance ($\alpha = 0.05$) using the *Statistical Package for Social Sciences* (SPSS) version 22.0 and R version 3.4.3.

The study followed the recommendations of Resolution no. 466/2012, of the National Health Council. The study was authorized by the Ethics Committee of the Nursing College of Ribeirão Preto of the University of São Paulo, under CAAE no. 34497414.0.0000.5393.

RESULTS

A total of 340 PLWH participated in the study, of which 40.6% referred to using alcohol. Among the participants, the

majority were male (57.9%), were aged between 30 and 49 years (55.6%) and had completed more than eight years of study (50.9%) (Table 1).

Table 1. Sociodemographic and clinical profile of people living with HIV. Ribeirão Preto, SP, Brazil, 2016.

Variable	Alcohol consumption		
	Yes n (%)	No n (%)	Total n (%)
	136 (40.6)	204 (59.4)	340 (100)
Sex			
Male	96 (28.2)	101 (29.7)	197 (57.9)
Female	42 (12.4)	101 (29.7)	143 (42.1)
Age (in years)			
≤ 30	30 (8.8)	22 (6.5)	52 (15.3)
30H49	74 (21.8)	115 (33.8)	189 (55.6)
≥ 50	34 (10.0)	65 (19.1)	99 (29.1)
Education (in years of study)			
< 8	57 (16.8)	110 (32.4)	167 (49.1)
≥ 8	81 (23.8)	92 (27.1)	173 (50.9)
Time since HIV diagnosis (in years)			
< 5	56 (16.5)	65 (19.1)	121 (35.6)
5–10	24 (7.1)	38 (11.2)	62 (18.2)
11–20	45 (13.2)	87 (25.6)	132 (38.8)
> 20	13 (3.8)	12 (3.5)	25 (7.4)
Time using ARVT* (in years)			
< 5	71 (20.9)	82 (24.1)	153 (45.0)
5–10	25 (7.4)	43 (12.6)	68 (20.0)
11–20	40 (11.8)	75 (22.1)	115 (33.8)
> 20	02 (0.6)	02 (0.6)	04 (1.2)
TCD4+ cell count (cell/mm ³)			
≥ 200	128 (37.6)	190 (55.9)	318 (93.5)
< 200	10 (2.9)	12 (3.5)	22 (6.5)
Viral load (copies/mL)			
≤ 40	104 (30.6)	171 (50.3)	275 (80.9)
> 40	34 (10.0)	31 (9.1)	65 (19.1)
Adherence to ARVT*			
Insufficient or low	30 (8.8)	38 (11.2)	68 (20.0)
Good or strict	108 (31.8)	164 (48.2)	272 (80.0)
Total			340 (100.0)

*ARVT: Antiretroviral Therapy.

Regarding the clinical variables, it was identified that 53.8% had been diagnosed with HIV for less than 10 years, the same time being observed for 65.0% for the use of ARVT. Moreover, 93.5% had a TCD4+ lymphocytes count greater than or equal to 200 cell/mm³, 80.9% had undetectable viral load, and 80.0% were classified with good or strict adherence (Table 1).

The bivariate analysis analyzed the clinical outcomes associated with alcohol consumption and identified that only viral load had a statistically significant association with alcohol consumption ($p=0.007$), as per Table 2.

In Figure 1, it can be seen that those with longer since their diagnosis and who had been using ARVT for longer were related to high alcohol consumption.

The logistical regression analysis (Table 3) identified that people with detectable viral load (>40 copies/mL) have 1.76 times more chance ($p=0.04$; 95%CI 1.00–3.05) of consuming alcohol.

DISCUSSION

In this study, a high prevalence of alcohol consumption was identified among PLWH, corroborating other studies carried out with this population in Brazil and around the world also showing a high prevalence of alcohol consumption, with percentages above 50%⁽¹¹⁻¹³⁾.

Such a result signals important implications for self-management of these individuals in managing HIV infection throughout life⁽¹⁴⁾, since the use of psychoactive substances can harm treatment in different ways, including behavioral, with reduced adherence to treatment^(1,15).

Among the aspects related to HIV infection, the consumption of alcoholic beverages was more prevalent among PLWH with longer since diagnosis and who had been using ARVT for longer. Therefore, the use of alcohol may be considered a coping mechanism, which may help alleviate the stress from living with a chronic condition⁽³⁾.

Table 2. Clinical outcomes associated with alcohol consumption in people living with HIV. Ribeirão Preto, SP, Brazil, 2016.

Variable	Alcohol consumption				P
	No	Low /moderate	High	Total	
	n (%)	n (%)	n (%)	n (%)	
	202 (59.4)	119 (35)	19 (5.6)	340 (100)	
Time since HIV diagnosis (in years)					
<5	65 (32.2)	53 (44.5)	3 (15.8)	121 (35.6)	0.076 [§]
5–10	38 (18.8)	19 (16.0)	5 (16.3)	62 (18.2)	
11–20	87 (43.1)	36 (30.3)	9 (47.4)	132 (38.8)	
>20	12 (5.9)	11 (9.2)	2 (10.5)	25 (7.4)	
Time using ARVT* (in years)					
<5	82 (40.6)	66 (55.5)	5 (26.3)	153 (45.0)	0.073 [§]
5–10	43 (21.3)	21 (17.6)	4 (21.1)	68 (20.0)	
11–20	75 (37.1)	30 (25.2)	10 (52.6)	115 (33.8)	
>20	2 (1.0)	2 (1.7)	0 (0.0)	4 (1.2)	
TCD4+ cell count (cell/mm ³)					
≥200	190 (94.1)	110 (92.4)	18 (94.7)	318 (93.5)	0.829 [§]
<200	12 (5.9)	9 (7.6)	1 (5.3)	22 (6.5)	
Viral load (copies/mL)					
≤40	171 (84.7)	91 (76.5)	13 (68.4)	275 (80.9)	0.007[†]
>40	31 (15.3)	28 (23.5)	6 (31.6)	65 (19.1)	
Adherence					
Insufficient or low	38 (18.8)	24 (20.2)	06 (31.6)	68 (20.0)	0.412 [†]
Good or strict	164 (81.2)	95 (79.8)	13 (68.4)	272 (80.0)	

*ARVT: Antiretroviral Therapy; [†]Chi-Squared; [§]Fisher's Exact.

Another important aspect found in the literature indicates that higher consumption is also present in those yet to begin drug therapy and may be a factor in the delayed seeking of treatment for HIV infection⁽¹⁶⁾.

In the same way, another study shows that abstinence and reduced consumption are observed alongside beginning ARVT⁽¹⁷⁾, which may be a result of orientation on the treatment offered by healthcare professionals.

However, findings that indicate abusive use of alcoholic beverages among those with more time since diagnosis and a longer period of ARVT, suggest that after reaching viral

suppression and adaptation to ARVT, there may be a relapse into alcohol consumption⁽¹⁸⁾. The results of the present study reinforce the importance of psychosocial support for the patient throughout treatment, given that adherence may diminish over time after prolonged periods of treatment^(1,15).

In contrast, an American study with 110 PLWH showed that regardless of the level of social support, PLWH with symptoms of depression tend to consume alcohol during episodes of anguish and that it is associated with abusive use⁽¹⁹⁾.

Regarding the clinical outcome, the progress marker of the disease related to the consumption of alcoholic beverages was the detectable viral load, in which PLWH that have detectable viral load have a higher chance of consuming alcohol. There is evidence that alcohol consumption among PLWH is also related to lack of adherence to ARVT, risky sexual behavior, the appearance of opportunist infections, and the consequent increase of morbimortality^(1,15).

The relationship of not achieving viral suppression and high susceptibility to viral resistance is linked to the reduction of the process of antiretroviral metabolization, since ethanol competes with medication at the isoenzyme bonds at a hepatic level and interacts with antiretrovirals^(20,21).

Thus, given the implications caused by alcohol in the lives of PLWH, treatment should be holistic and free of prejudice, so as to fulfill the needs of individuals, supporting them in the process of self-management, promoting empowerment and co-responsibility for self-care.

The harmful use of alcohol can negatively impact social, physical, and cognitive relationships⁽²¹⁾. Therefore, it should be emphasized that people using alcohol require special attention from healthcare services. Within this perspective, healthcare professionals should seek to strengthen the bond between PLWH and their families, as well as linking up with healthcare networks and other care facilities such as social and community services to achieve holistic care for PLWH.

Studies show that the support offered by professionals remains insufficient^(15,22). This indicates a need for greater participation of the individual in the management of their own care and greater training of professionals to meet this demand in striving for health promotion.

The results found in the present study have a relevant contribution to nursing care, as they reflect on the care practice within the perspective of the Systematization of Nursing Care. Furthermore, the results may also help broaden

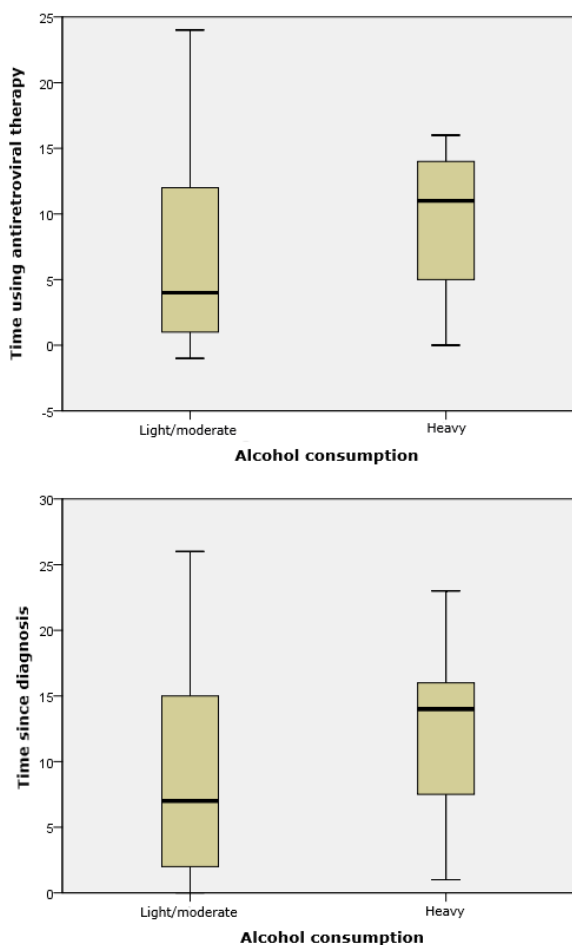


Figure 1. Boxplot of time since diagnosis and time using antiretroviral therapy in relation to alcohol consumption in people living with HIV. Ribeirão Preto, SP, Brazil, 2016.

Table 3. Logistical regression analysis between clinical outcome and alcohol consumption in people living with HIV. Ribeirão Preto, SP, Brazil, 2016.

Variable	Total Odds	p	95%CI	β (SE)	Adjusted Odds	p	95%CI
Viral load							
>40 copies/mL	1.93	0.03	1.03–3.61	0.56 (0.28)	1.75	0.04	1.00–3.05

β : logistical regression coefficient; SE: standard error; 95%CI: confidence interval 95%; p<0.05.

the view of the nurse regarding the vulnerability of PLWH to alcohol consumption, with the aim of reducing harm and improving clinical outcomes, based on interventions encompassing biopsychosocial aspects. Moreover, there are few national nursing studies on alcohol consumption and their impact on the clinical outcomes of PLWH.

Regarding the limitations of the study, as a cross-sectional study, it was not possible to establish temporal relationships between the variables. Another limitation consisted of the inclusion of individuals that were active in accompanying their health, that is, only those who appeared for appointments. In addition, patients were not questioned as to the type of alcoholic beverage consumed.

CONCLUSION

The study showed a high prevalence of alcohol consumption among PLWH. Furthermore, the data showed that those with longer since diagnosis and who had been using ARVT for longer were related to high alcohol consumption, and the associated clinical outcome was viral load.

The results of the present study reinforce the importance of identifying groups that are more susceptible and more vulnerable to alcohol, given that these provide support for the choice of the most suitable interventions to reduce the damage resulting from consumption among PLWH.

Therefore, given the scarcity of studies addressing this theme in Brazil, it is recommended that new discussions are promoted through further studies aimed at also evaluating individuals with low adherence to treatment, and verify its association with the use of alcohol. Thus, it is hoped that there are increasing contributions to the development of a more substantial body of knowledge that could provide support to improving the care of PLWH.

REFERENCES

1. Nouaman MN, Vinikoor M, Seydi M, Ekouevi DK, Coffie PA, Mulenga L, et al. High prevalence of binge drinking among people living with HIV in four African countries. *J Int AIDS Soc* [Internet]. 2018 [access at: Dec. 19, 2018];21(12):e25202. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/jia2.25202>. <http://doi.org/10.1002/jia2.25202>.
2. Omeje JC, Otu MS, Aneke AO, Adikwu VO, Nwaubani OO, Chigbu EF, et al. Effect of rational emotive health therapy on alcohol use among community-dwelling, HIV-positive patients. *Medicine (Baltimore)* [Internet]. 2018 [access at: Dec. 19, 2018];97(35):e11688. Available at: https://journals.lww.com/md-journal/Fulltext/2018/08310/Effect_of_Rational_Emotive
3. Williams EC, Joo YS, Lipira L, Glass JE. Psychosocial stressors and alcohol use, severity, and treatment receipt across human immunodeficiency virus (HIV) status in a nationally representative sample of US residents. *Subst Abuse* [Internet]. 2017 [access at: Dec. 19, 2018];38(3):269-77. Available at: <https://www.randfonline.com/doi/full/10.1080/08897077.2016.1268238>. <http://doi.org/10.1080/08897077.2016.1268238>.
4. Crawford TN, Thornton AC. Alcohol use and multimorbidity among individuals living with HIV. *AIDS Behav* [Internet]. 2019 [access at: Jan. 19, 2019];23:152-60. Available at: <https://link.springer.com/article/10.1007/s10461-018-2242-y>. <http://doi.org/10.1007/s10461-018-2242-y>.
5. Williams EC, Hahn JA, Saitz R, Bryant K, Lira MC, Samet JH. Alcohol use and human immunodeficiency virus (HIV) infection: current knowledge, implications, and future directions. *Alcohol Clin Exp Res* [Internet]. 2016 [access at: Dec. 19, 2018];40(10):2056-72. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/acer.13204>. <http://doi.org/10.1111/acer.13204>.
6. Kader R, Govender R, Seedat S, Koch JR, Parry C. Understanding the impact of hazardous and harmful use of alcohol and/or other drugs on ARV adherence and disease progression. *PLoS ONE* [Internet]. 2015 [access at: Dec. 19, 2018];10(5):e0125088. Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0125088>. <http://doi.org/10.1371/journal.pone.0125088>.
7. World Health Organization. Department of Mental Health and Substance Dependence. Investing in mental health: evidence for action [Internet]. Geneva: WHO; 2013 [access at: Dec. 19, 2018]. Available at: http://apps.who.int/iris/bitstream/handle/10665/87232/9789241564618_eng.pdf;jsessionid=523F6B04347367E51C3FC8316AD35B26?sequence=1.
8. Williams EC, McGinnis KA, Edelman EJ, Matson TE, Gordon AJ, Marshall BDL, et al. Level of Alcohol Use Associated with HIV Care Continuum Targets in a National U.S. Sample of Persons Living with HIV Receiving Healthcare. *AIDS Behav* [Internet]. 2019 [access at: Mar. 30, 2020];23(1):140-51. Available at: <https://link.springer.com/article/10.1007%2Fs10461-018-2210-6#citeas>. <https://doi.org/10.1007/s10461-018-2210-6>.
9. Remor E. Systematic review of the psychometric properties of the questionnaire to evaluate the adherence to HIV therapy (CEAT-VIH). *Patient* [Internet]. 2013

- [access at: Dec. 19, 2018];6(2):61-73. Available at: <https://link.springer.com/article/10.1007%2Fs40271-013-0009-0#citeas>. <http://doi.org/10.1007/s40271-013-0009-0>.
10. 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* [Internet]. 2017 [access at: Dec. 19, 2018];38(1):e63158. Available at: https://www.scielo.br/scielo.php?script=sci_arttext&pid=S1983-14472017000100406&lng=pt&tlng=pt. <http://doi.org/10.1590/1983-1447.2017.01.63158>.
 11. Crane HM, McCaul ME, Chander G, Hutton H, Nance RM, Delaney JAC, et al. Prevalence and Factors Associated with Hazardous Alcohol Use Among Persons Living with HIV Across the US in the Current Era of Antiretroviral Treatment. *AIDS Behav* [Internet]. 2017 [access at: Dec. 19, 2018];21(7):1914-25. Available at: <https://link.springer.com/article/10.1007%2Fs10461-017-1740-7#citeas>. <http://doi.org/10.1007/s10461-017-1740-7>.
 12. Wandeler G, Kraus D, Fehr J, Conen A, Calmy A, Orasch C, et al. The J-curve in HIV: Low and moderate alcohol intake predicts mortality but not the occurrence of major cardiovascular events. *J Acquir Immune Defic Syndr* [Internet]. 2016 [access at: Dec. 19, 2018];71(3):302-9. Available at: https://journals.lww.com/jaids/Fulltext/2016/03010/The_J_Curve_in_HIV_Low_and_Moderate_Alcohol.9.aspx. <http://doi.org/10.1097/QAI.0000000000000864>.
 13. Silva CM, Mendoza-Sassi RA, Mota LD, Nader MM, Martinez AMB. Alcohol use disorders among people living with HIV/AIDS in Southern Brazil: prevalence, risk factors and biological markers outcomes. *BMC Infect Dis* [Internet]. 2017 [access at: Dec. 19, 2018];17(1):1-8. Available at: <https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-017-2374-0#citeas>. <http://doi.org/10.1186/s12879-017-2374-0>.
 14. Perazzo J, Webel A. Alcohol use and HIV self-management. *J Assoc Nurses AIDS Care* [Internet]. 2017 [access at: Dec. 19, 2018];28(2):295-9. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S1055329016000455?via%3Dihub>. <http://doi.org/10.1016/j.jana.2016.02.006>.
 15. Santos VF, Pedrosa SC, Aquino PS, Lima ICV, Cunha GH, Galvão MTG. Social support of people with HIV/AIDS: the Social Determinants of Health Model. *Rev Bras Enferm* [Internet]. 2018 [access at: Dec. 19, 2018];71(supl 1):625-30. Available at: <https://www.scielo.br/pdf/reben/v71s1/0034-7167-reben-71-s1-0625.pdf>. <http://dx.doi.org/10.1590/0034-7167-2017-0346>.
 16. Deiss RG, Mesner O, Agan BK, Ganesan A, Okulicz JF, Bavaro M, et al. Characterizing the association between alcohol and HIV virologic failure in a military HIV-infected cohort on antiretroviral therapy. *Alcohol Clin Exp Res* [Internet]. 2016 [access at: Dec. 19, 2018];40(3):449-535. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5815520/>. <http://doi.org/10.1111/acer.12975>.
 17. Santos GM, Emenyonu NI, Bajunirwe F, Mocello AR, Martin JN, Vittinghoff E, et al. Self-reported alcohol abstinence associated with ART initiation among HIV-infected persons in rural Uganda. *Drug Alcohol Depend* [Internet]. 2014 [access at: Dec. 19, 2018];134(1):151-57. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0376871613004043?via%3Dihub>. <http://doi.org/10.1016/j.drugalcdep.2013.09.025>.
 18. Wardell JD, Shuper PA, Rourke SB, Hendershot CS. Stigma, Coping, and Alcohol Use Severity Among People Living With HIV: A Prospective Analysis of Bidirectional and Mediated Associations. *Ann Behav Med* [Internet]. 2018 [access at: Dec. 19, 2018];52(9):762-72. Available at: <https://academic.oup.com/abm/article-abstract/52/9/762/4822985?redirectedFrom=fulltext>. <http://doi.org/10.1093/abm/kax050>.
 19. Moitra E, Anderson BJ, Herman DS, Hayaki J, Pinkston MM, Kim HN, et al. Examination of using alcohol to cope, depressive symptoms, and perceived social support in persons with HIV and Hepatitis C. *AIDS Care* [Internet]. 2020 [access at: Mar. 30, 2020];32:1238-45. Available at: <https://www.tandfonline.com/doi/citedby/10.1080/09540121.2020.1734177?scroll=top&needAccess=true>. <https://doi.org/10.1080/09540121.2020.1734177>.
 20. Chibanda D, Benjamin L, Weiss HA, Abas M. Mental, neurological, and substance use disorders in people living with HIV/AIDS in low- and middle-income countries. *J Acquir Immune Defic Syndr* [Internet]. 2014 [access at: Dec. 19, 2018];67(Suppl 1):S54-S67. Available at: https://journals.lww.com/jaids/Fulltext/2014/09011/Mental_Neurological_and_Substance_Use_Disorders.7.aspx. <http://doi.org/10.1097/QAI.0000000000000258>.
 21. Santos VF, Galvão MTG, Cunha GH, Lima ICV, Gir E. Alcohol effect on HIV-positive individuals: treatment and quality of life. *Acta Paul Enferm* [Internet]. 2017 [access at: Dec. 19, 2018];30(1):94-100. Available at: <http://dx.doi.org/10.1590/1982-0194201700014>.

22. Pedrosa SC, Fiuza MLT, Cunha GH, Reis RK, Gir E, Galvão MTG, et al. Social Support for People Living With Acquired Immunodeficiency Syndrome. *Texto Contexto Enferm* [Internet]. 2016 [access at: Dec. 19, 2018];25(4):e2030015. Available at: https://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-07072016000400309&lng=en&tlng=en. <http://doi.org/10.1590/0104-07072016002030015>.

