

Prevalence and factors associated with the generalized anxiety disorder among people living with HIV/AIDS in Brazilian outpatient clinics

Prevalência e fatores associados a transtorno de ansiedade generalizado entre pessoas vivendo com HIV/AIDS em serviços ambulatoriais brasileiros

Rafael Dantas Santana^{1,2}. Carolina Saraiva Nunes de Pinho². Francisco Marto Leal Pinheiro Júnior². Fabrício de Maicy Bezerra³. Malena Gadelha Cavalcante³. Eugênio de Moura Campos¹. Roberto da Justa Pires Neto¹.

1 Universidade Federal do Ceará (UFC), Fortaleza, Ceará, Brasil. 2 Hospital Universitário Walter Cantídio (HUWC), Fortaleza, Ceará, Brasil. 3 Secretaria Municipal de Saúde, Fortaleza, Ceará, Brasil.

ABSTRACT

Introduction: The Generalized Anxiety Disorder (GAD) is a chronic worrying disorder, which causes social and occupational impairment. **Objective:** The aim of this study was to estimate the prevalence of GAD among people living with HIV/AIDS (PLWHA) and to determine the associated socio-demographic and clinical factors. **Methodology:** We conducted a cross-sectional study between September 2014 and April 2015 at four HIV outpatient clinics in Fortaleza, Northeastern Brazil. We surveyed 257 individuals living with HIV/AIDS, aged > 18-years, of both sexes. Four modalities of instruments were used to collect the data: a socio-demographic questionnaire; the Mini International Neuropsychiatric Interview; the Hamilton's Anxiety Scale; and chart data. **Results:** GAD prevalence was 14%. Female sex, CD4 200-500 versus < 200, CD4 > 500 versus < 200 and being homeless were associated in the multivariate model. **Conclusion:** The study demonstrates the necessity of proactively addressing mental health as well as physical health issues in HIV+ individuals.

Keywords: Mental health. Anxiety disorder. Acquired immunodeficiency syndrome.

RESUMO

Introdução: o Transtorno de Ansiedade Generalizada (TAG) é um transtorno mental crônico caracterizado por preocupação excessiva e sintomas como inquietação, dificuldade de concentração, tensão muscular e insônia, com prejuízo social e ocupacional. **Objetivo:** avaliar a prevalência de TAG em indivíduos com HIV/AIDS, além de fatores clínicos e sociodemográficos associados. **Metodologia:** foi conduzido um estudo transversal, observacional, entre setembro de 2014 e abril de 2015, em quatro serviços ambulatoriais públicos especializados em HIV em Fortaleza, Ceará. Foram entrevistados 257 indivíduos com HIV/AIDS, maiores de 18 anos, de ambos os sexos. Quatro modalidades de instrumentos foram utilizadas para coleta de dados: 1) um questionário sociodemográfico; 2) a versão em português do *Mini International Neuropsychiatric Interview* (MINI); 3) a Escala de Ansiedade de Hamilton; e 4) dados de prontuários. **Resultados:** a prevalência de TAG foi de 14%. Sexo feminino, CD4 200-500 versus < 200, CD4 > 500 versus < 200 e ter estado em situação de rua tiveram associação estatisticamente significativa com TAG no modelo multivariado. **Conclusão:** este estudo mostra a necessidade de uma abordagem proativa da saúde mental de indivíduos com HIV, devendo ser investigados transtornos de ansiedade como o TAG nessa população.

Palavras-chave: Saúde mental. Transtorno de ansiedade. Síndrome de imunodeficiência adquirida.

Corresponding author: Roberto da Justa Pires Neto, Rua Professor Costa Mendes, 1608, Rodolfo Teófilo, Fortaleza, Ceará. CEP: 60430-140. Telephone: +55 85 3366-8044/99991-4182. E-mail: robertojusta@ufc.br

Conflict of interests: The authors have no conflicts of interest to declare.

Received: 21 Mar 2018; Revised: 08 Dec 2018; Accepted: 08 Dec 2018.

INTRODUCTION

The infection by the Human Immunodeficiency Virus (HIV) affects approximately 37 million people worldwide,¹ and 734,000 people in Brazil.² HIV incidence and mortality have declined in most parts of the world. However, HIV incidence in Brazil has increased.³

Studies have reported higher prevalence (between 33% and 47%) of mental disorders for people living with HIV/AIDS (PLWHA).⁴⁻⁶ Several determinants may be involved in the association between mental disorders and HIV infection, such as the effects of the virus on the central nervous system, opportunistic infections, antiretroviral therapy (ART), emotional reactions to diagnosis, fear of death and stigma.⁷⁻⁹

The Generalized Anxiety Disorder (GAD) is a chronic disorder characterized by excessive and uncontrollable worry associated with psychic and physical symptoms, with significant social and occupational impairment, and its prevalence ranges from 1.4% to 15.8% in PLWHA.^{8,10-12} Other factors accentuate the importance of studying GAD, such as: it is frequently combined with other mental disorders and increases the likelihood of first onset of mood disorders, panic disorder and substance abuse disorders;^{13,14} it represents an independent risk factor for coronary morbidity, and causes high economic burden.¹⁴

The aim of this study was to estimate the prevalence of Generalized Anxiety Disorders (GAD) among PLWHA in a major Brazilian city, and to determine associations with socio-demographic and clinical factors.

METHOD

We conducted a cross-sectional study between September 2014 and April 2015, in four public HIV clinics in Fortaleza, the fifth most populous city in Brazil. A convenience sample of HIV-infected patients awaiting clinic visits were invited to participate. The purpose and methodology of the survey were explained to all candidates, and written consent requested. Individuals of both sexes, 18-year-old and over, diagnosed with HIV, whether or not in antiretroviral treatment, were included. Individuals with dementia, drunk or otherwise incapacitated were excluded. The Mini-Mental State Examination (MMSE)¹⁵ was used to assess cognitive impairment. There was no language barrier.

Four modalities of data collection instruments were used: (a) A Socio-demographic questionnaire elicited information on sex, age, marital status, income, time since diagnosis of HIV, and use of antiretroviral medication; (b) A section of the Mini International Neuropsychiatric Interview – MINI¹⁶ was used to assess GAD; (c) For patients diagnosed with GAD, we used Hamilton's Anxiety Scale (HAM-A);¹⁷ (d) We reviewed chart data for information on clinical aspects, history of opportunistic infections, antiretroviral treatment (ART), and viral load and CD4.

MINI is a structured questionnaire to diagnose mental disorders as encoded by the Diagnostic and Statistical Manual

of Mental Disorders (4th ed.; DSM-IV; American Psychiatric Association, 1994) and the International Classification of Diseases and Related Health Problems (10th ed.; ICD-10; World Health Organization, 1992). This instrument contains 16 modules identified by letters of the alphabet. It has been previously used to assess mental disorders in HIV + individuals in other studies.^{18,19} In this study, module O (Generalized Anxiety Disorder - GAD) was used. We attempted to exclude any anxiety symptom related to other mental disorders, such as the fear of panic disorder or public humiliation.

HAM-A is an instrument with rating scales developed to measure the severity of anxiety symptoms, and is widely used in both clinical and research settings. We interpreted the scores following Matza, Morlock, Sexton, Malley & Feltner.²⁰ The cases of GAD were classified into three groups: mild = 8 to 14; moderate = 15 to 23; and severe > 24.

Data were entered using EpiInfo (version 3.5.3) and analyzed with SPSS (version 11) utilizing chi-squared (χ^2) and Fisher's exact tests. We applied two-tailed tests with $\alpha = 0.05$. Variables significant at $p < 0.05$ were included in the multivariate model. We used a logistic regression to determine the factors predicting the occurrence of mental disorder. Confidence interval was set to 95% at the 0.05 level of significance.

Our research did not impose any risk to the studied patients. Participants were consented and we offered counseling to patients diagnosed with a mental disorder. The study was approved by the Research Ethics Committee of the Hospital São José de Doenças Infecciosas (Protocol 670.113).

RESULTS

We surveyed 264 individuals. Seven declined to participate in the study. The majority of the surveyed PLWHA fell within the following parameters: between 30 and 59 years-old (80.5%), male (61.9%), single (36.2%) and monthly income of up to 2 minimum wages (54.1%), around US\$ 480.00. The GAD prevalence was 14% (Table 1). Concerning the severity of GAD, 7.4% were considered mild cases, while 22.2% and 7.4% were considered moderate and severe, respectively.

Among women, the prevalence was of 20.4%, greater than for men ($p = 0.020$). GAD prevalence was also associated with lower income ($p = 0.020$). The prevalence was significantly higher in those who had been homeless ($p = 0.014$). In addition, GAD prevalence was associated to those cases with a family history of GAD and with those patients who had never presented CD4 < 200 cels/dL (Table 2). Most participants with GAD (68,8%) were not receiving proper treatment for the disorder by the time of the interview.

Female sex (OR: 2.909), CD4 200-500 versus < 200 (OR: 3.266), CD4 > 500 versus < 200 (OR: 4.089) and being a homeless (OR: 3.484) were associated in the multivariate model (Table 3).

Table 1. Socio-demographic characteristics of HIV-infected patients from outpatient clinics of Fortaleza, Brazil.

Socio-demographic variables		Total
		N (%)
Age group	18 - 29 years	35 (13.6)
	30 - 59 years	207 (80.5)
	≥ 60 years	15 (5.8)
Sex	Female	98 (38.1)
	Male	159 (61.9)
Marital status	Married or consensual marriage	82 (31.9)
	Divorced or separated	30 (11.7)
	Single without steady partner	93 (36.2)
	Widower	17 (6.6)
	Single with steady partner	35 (13.6)
Income	> 10 minimum wages	7 (2.8)
	4 to 10 minimum wages	48 (19.5)
	2 to 4 minimum wages	58 (23.6)
	Up to 2 minimum wages	133 (54.1)
Born in Fortaleza	Yes	162 (63.0)
	No	95 (37.0)
Born in the countryside	Urban	63 (66.3)
	Rural	32 (33.7)
Race	White	49 (19.1)
	Black/Mulatto	207 (80.9)
Education	Illiterate	20 (7.8)
	Elementary school	106 (41.2)
	High school	95 (37.0)
	Higher education	36 (14.0)

Table 2. Factors associated to GAD among HIV-infected patients of Fortaleza, Brazil.

		GAD		P	OR	95%CI	P
		Yes	No				
		N (%)	N (%)				
Socio-demographic variables							
Age group	> 18-29 years	6 (16.7)	29 (13.1)	0.847	-	-	-
	> 30-59 years	28 (77.8)	179 (81.0)		-	-	-
	> 60 years	2 (5.6)	13 (5.9)		-	-	-
Sex	Male	16 (44.4)	143 (64.7)	0.020	1.00	-	-
	Female	20 (55.6)	78 (35.3)		2.292	1.123	4.675
Marital status	Married or consensual marriage	9 (25.0)	73 (33.0)	0.142	-	-	-
	Divorced or separated	8 (22.2)	22 (10.0)		-	-	-
	Single without steady partner	14 (38.9)	79 (35.7)		-	-	-
	Widower	3 (8.3)	14 (6.3)		-	-	-
	Single with steady partner	2 (5.6)	33 (14.9)		-	-	-

OR: Odds ratio; CI: confidence interval.

Continue.

Sequence.

Table 2. Factors associated to GAD among HIV-infected patients of Fortaleza, Brazil.

		GAD		P	OR	95%CI		P
		Yes N (%)	No N (%)					
Socio-demographic variables								
Income	> 10 minimum wages	-	7 (3.3)	0.020	-	-	-	0.999
	4 to 10 minimum wages	1 (3.0)	47 (22.1)		0.092	0.012	0.698	0.021
	2 to 4 minimum wages	7 (21.2)	51 (23.9)		0.593	0.241	1.461	0.256
	Up to 2 minimum wages	25 (75.8)	108 (50.7)		1.000	-	-	-
Born in Fortaleza (capital)	Yes	23 (63.9)	139 (62.9)	0,384	-	-	-	-
	No	13 (36.1)	82 (37.1)		-	-	-	-
Born in the countryside	Urban	10 (76.9)	53 (64.6)	0.684	-	-	-	-
	Rural	3 (23.1)	29 (35.4)		-	-	-	-
Race	White	6 (16.7)	43 (19.5)	0.680	-	-	-	-
	Black/Mulatto	30 (83.3)	177 (80.5)		-	-	-	-
Education	Illiterate	3 (8.3)	17 (7.7)	0.171	-	-	-	-
	Elementary school	18 (50.0)	88 (39.8)		-	-	-	-
	High School	11 (30.6)	84 (38.0)		-	-	-	-
	Higher education	4 (11.1)	32 (14.5)		-	-	-	-
Possess a profession	Yes	29 (80.6)	196 (88.7)	0.083	-	-	-	-
	No	7 (19.4)	25 (11.3)		-	-	-	-
Currently working	Yes	12 (33.3)	108 (48.9)	0.252	-	-	-	-
	No	24 (66.7)	113 (51.1)		-	-	-	-
Has undergone unemployment	Yes	32 (88.9)	179 (81.0)	0.857	-	-	-	-
	No	4 (11.1)	42 (19.0)		-	-	-	-
Has lost a closed relative	Yes	32 (91.4)	204 (92.3)	0.857	-	-	-	-
	No	3 (8.60)	17 (7.7)		-	-	-	-
Has been a homeless	Yes	6 (16.7)	12 (5.4)	0.014	3.483	1.216	9.975	0.020
	No	30 (83.3)	209 (94.6)		1.000	-	-	-
Has been inmate	Yes	2 (5.6)	3 (1.4)	0.091	-	-	-	-
	No	34 (94.4)	218 (98.6)		-	-	-	-
Clinic variables								
Hospitalized after HIV infection	Yes	13 (36.1)	90 (42.5)	0.475	-	-	-	-
	No	23 (63.9)	122 (57.5)		-	-	-	-
Use ART	Yes	35 (97.2)	190 (86.0)	0.058	-	-	-	-
	No	1 (2.8)	31 (14)		-	-	-	-
Adhered to ART	Yes	32 (88.9)	198 (90.0)	0.838	-	-	-	-
	No	4 (11.1)	22 (10.0)		-	-	-	-
Family history of GAD	Yes	15 (48.4)	1 (0.5)	<0.001	206.250	25.590	1662.335	<0.001
	No	16 (51.6)	220 (99.5)		1.000	-	-	-
Opportunistic disease	Yes	12 (33.3)	90 (40.7)	0.401	-	-	-	-
	No	24 (66.7)	131 (59.3)		-	-	-	-
Efavirenz use	Yes	17 (48.6)	89 (40.5)	0.365	-	-	-	-
	No	18 (51.4)	131 (59.5)		-	-	-	-

OR: Odds ratio; CI: confidence interval.

Continue.

Conclusion.

Table 2. Factors associated to GAD among HIV-infected patients of Fortaleza, Brazil.

		GAD		P	OR	95%CI	P
		Yes N (%)	No N (%)				
Clinic variables							
Latest CD4 value	< 200	2 (5.7)	25 (11.8)	0.101	-	-	-
	200 – 500	8 (22.9)	76 (36.0)		-	-	-
	>500	25 (71.4)	110 (52.1)		-	-	-
Lowest CD4 value	< 200	7 (21.2)	109 (52.2)	0.003	1.000	-	-
	200 – 500	19 (57.6)	80 (38.3)		3.698	1.484	9.218
	>500	7 (21.2)	20 (9.6)		5.450	1.724	17.230
Lowest viral load	< 10,000	12 (85.7)	69 (85.2)	0.058	-	-	-
	10,000 – 100,000	-	10 (12.3)		-	-	-
	> 100,000	2 (14.3)	2 (2.5)		-	-	-
Latest viral load	< 10,000	17 (56.7)	67 (42.7)	0.117	-	-	-
	10,000 – 100,000	10 (33.3)	47 (29.9)		-	-	-
	> 100,000	3 (10.0)	43 (27.4)		-	-	-

OR: Odds ratio; CI: confidence interval.

Table 3. Multivariate model for the factors associated to GAD in HIV-infected patients of Fortaleza, Brazil.

Variables	OR	95%CI	P
Female <i>versus</i> male	2.909	1.296 – 6.530	0.010
CD4 200-500 <i>versus</i> < 200	3.266	1.280 – 8.330	0.013
CD4 > 500 <i>versus</i> < 200	4.089	1.230 – 13.594	0.022
Has been a homeless <i>versus</i> has not been a homeless	3.484	1.087 – 11.164	0.036

OR: Odds ratio; CI: confidence interval.

DISCUSSION

The GAD prevalence found in our study (14%) is much greater than that of the general population (3.7%).²¹ Other studies found a GAD prevalence of 2.2%,²² 1.4%¹¹ and 3.6%,²³ probably owing to methodological issues, such as the use of a semi-structured instrument or a smaller sample size and cultural/regional differences.

Besides the association found between GAD and lower incomes, 66.7% of the individuals were unemployed. This finding highlights how income and work related issues might influence the expression of GAD, as revealed by other studies.^{10,24} Moreover, the fact that we detected an association between GAD and having been a homeless supports the relationship between poor socioeconomic conditions, stigma and mental illness.⁹

There is no consensus about the association between adherence to ART and GAD.²⁵⁻²⁷ In our study most of the patients were enrolled in ART. This might be due to the fact that the sample was constituted by patients who were attending medical appointments, which, we might suppose, would more probably

follow the treatment prescribed than those who didn't attend appointments. Also, this might reflect better access to ART by general population.

While some studies show higher GAD prevalence in individuals with lower CD4's²⁴ or did not show any significant association,²⁸ in our study higher CD4 values were correlated with the GAD prevalence. Such an apparently controversial finding may follow the same rationale explained above: worried patients may have initiated ART earlier, reflecting higher CD4s. Here we draw a parallel between the "worried well" and the "worried ill".

Some antiretroviral drugs, such as efavirenz, are known to cause psychiatric side effects like depression, insomnia and anxiety.²⁹ One might think that the association between higher CD4 and GAD would reflect ART adherence, especially efavirenz. However, we found no association between efavirenz use and GAD (Table 2).

Few studies assessed the severity of GAD on PLWHA. Els et al.³⁰ identified HAM-A scores above 20 in 31% of the sample. In our study, higher scores were present in most patients

(70.4% indicate severe anxiety). These are worrying facts, since most of the participants with GAD (68.8%) were not prescribed a specific treatment for the disorder.

Our study has an important limitation. The sample is a convenience sample, drawn from a clinic setting, and may not represent the majority of PLWHA. As mentioned, GAD and clinic attendance may not be independent, and may have greatly influenced our findings. The profile of our study patients corresponds to that of those who regularly frequent medical services. In general, available laboratory tests demonstrate

adherence to treatment, which may not correspond to the reality of a great number of HIV-infected patients with mental disorders. While curiously we show an association between GAD and higher CD4 counts, this does not obviate the suffering and social and economic effects of GAD. Certainly, this relationship deserves further investigation.

We conclude that GAD is present in a large number of HIV+ patients. Given that, the condition should be addressed in all clinical services that address persons living with HIV/AIDS.

REFERÊNCIAS

- UNAIDS. AIDS by the numbers 2015 [Internet]. Geneva: Switzerland; 2015 [Cited: 7 Mar 2017]. Available from: http://www.unaids.org/sites/default/files/media_asset/AIDS_by_the_numbers_2015_en.pdf
- Brasil. Ministério da Saúde. Boletim epidemiológico: HIV/AIDS [Internet]. Brasília: Ministério da Saúde; 2014 [Cited: 2 May 2017]. Available from: http://www.aids.gov.br/sites/default/files/anexos/publicacao/2014/56677/boletim_2014_final_pdf_15565.pdf
- UNAIDS. The gap report [Internet]. Geneva: Switzerland; 2014 [Cited: 7 Apr 2016]. Available from: http://www.unaids.org/sites/default/files/media_asset/UNAIDS_Gap_report_en.pdf
- Pappin M, Wouters E, Booyens FL. Anxiety and depression amongst patients enrolled in a public sector antiretroviral treatment programme in South Africa: a cross-sectional study. *BMC Public Health*. 2012;12(1):244.
- Robertson K, Bayon C, Molina JM, McNamara P, Resch C, Muñoz-Moreno JA, et al. Screening for neurocognitive impairment, depression, and anxiety in HIV-infected patients in Western Europe and Canada. *AIDS Care*. 2014;26(12):1555-61.
- Treisman G, Angelino A. Interrelation between psychiatric disorders and the prevention and treatment of HIV infection. *Clin Infect Dis*. 2007;45(Suppl 4):S313-17.
- Chandra PS, Desai G, Ranjan S. HIV and psychiatric disorders. *Indian J Med Res*. 2005;121(4):451-67.
- Shacham E, Rosenburg N, Önen NF, Donovan MF, Overton ET. Persistent HIV-related stigma among an outpatient US clinic population. *Int J STD AIDS*. 2015;26(4):243-50.
- Whetten K, Reif S, Whetten R, Murphy-McMillan LK. Trauma, mental health, distrust, and stigma among HIV-positive persons: implications for effective care. *Psychosom Med*. 2008;70(5):531-8.
- Bing EG, Burnam MA, Longshore D, Fleishman JA, Sherbourne CD, London AS, et al. Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. *Arch Gen Psychiatry*. 2001;58(8):721-8.
- Olagunju AT, Adeyemi JD, Ogbolu RE, Campbell EA. A study on epidemiological profile of anxiety disorders among people living with HIV/AIDS in a Sub-Saharan Africa HIV Clinic. *AIDS Behav*. 2012;16(8):2192-7.
- van den Heuvel L, Chishinga N, Kinyanda E, Weiss H, Patel V, Ayles H, et al. Frequency and correlates of anxiety and mood disorders among TB-and HIV-infected Zambians. *AIDS Care*. 2013;25(12):1527-35.
- Simon NM. Generalized anxiety disorder and psychiatric comorbidities such as depression, bipolar disorder, and substance abuse. *J Clin Psychiatry*. 2009;70(Suppl 2):10-14.
- Newman MG, Llera SJ, Erickson TM, Przeworski A, Castonguay LG. Worry and generalized anxiety disorder: a review and theoretical synthesis of evidence on nature, etiology, mechanisms, and treatment. *Annu Rev Clin Psychol*. 2013;9(1):275-97.
- Folstein MF, Folstein SE, McHugh PR. "Mini-mental state": a practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res*. 1975;12(3):189-98.
- Amorim P. Mini International Neuropsychiatric Interview (MINI): validação de entrevista breve para diagnóstico de transtornos mentais. *Rev Bras Psiquiatr*. 2000;22(3):106-15.
- Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol*. 1959;32(1):50-5.
- Myer L, Smit J, Roux LL, Parker S, Stein DJ, Seedat S. Common mental disorders among HIV-infected individuals in South Africa: prevalence, predictors, and validation of brief psychiatric rating scales. *AIDS Patient Care STDS*. 2008;22(2):147-58.
- Schadé A, Van Grootheest G, Smit JH. HIV-infected mental health patients: characteristics and comparison with HIV-infected patients from the general population and non-infected mental health patients. *BMC Psychiatry*. 2013;13(1):1.
- Matza LS, Morlock R, Sexton C, Malley K, Feltner D. Identifying HAM-A cutoffs for mild, moderate, and severe generalized anxiety disorder. *Int J Methods Psychiatr Res*. 2010;19(4):223-32.
- Viana MC, Andrade LH. Lifetime prevalence, age and gender distribution and age-of-onset of psychiatric disorders in the São Paulo Metropolitan Area, Brazil: results from the São Paulo Megacity Mental Health Survey. *Rev Bras Psiquiatr*. 2012;34(3):249-60.
- Morrison MF, Petitto JM, Ten Have T, Gettes DR, Chiappini MS, Weber AL, et al. Depressive and anxiety disorders in women with HIV infection. *Am J Psychiatry*. 2002;159:789-96.
- Berger-Greenstein JA, Cuevas CA, Brady SM, Trezza G, Richardson MA, Keane TM. Major depression in patients with HIV/AIDS and substance abuse. *AIDS Patient Care STDS*. 2007;21(12):942-55.

24. Shacham E, Morgan JC, Önen NF, Taniguchi T, Overton ET. Screening anxiety in the HIV Clinic. *AIDS Behav.* 2012;16(8):2407-13.
25. Palmer NB, Basinski JR, Uldall KK. Psychiatric illness, access and adherence to HAART: a brief review of recent findings and implications for care. *HIV Ther.* 2010;4(2):215-30.
26. Panigrahi M, Swain TR, Mohanty S. Nonadherence to anti-HIV medication is associated with higher level of anxiety: experience from a tertiary care hospital of Odisha. *Indian J Pharmacol.* 2015;47(6):672.
27. Springer SA, Dushaj A, Azar MM. The impact of DSM-IV mental disorders on adherence to combination antiretroviral therapy among adult persons living with HIV/AIDS: a systematic review. *AIDS Behav.* 2012;16(8):2119-43.
28. Gaynes BN, Pence BW, Eron JJ Jr, Miller WC. Prevalence and comorbidity of psychiatric diagnoses based on reference standard in an HIV+ patient population. *Psychosom Med.* 2008;70(4):505.
29. Abers MS, Shandera WX, Kass JS. Neurological and psychiatric adverse effects of antiretroviral drugs. *CNS Drugs.* 2014;28:131-45.
30. Els C, Boshoff W, Scott C, Strydom W, Joubert G, Van der Ryst E. Psychiatric co-morbidity in South African HIV/AIDS patients. *S Afr Med J.* 1999;89:992-4.

How to cite:

Santana RD, Pinho CS, Pinheiro FM Júnior, Bezerra FM, Cavalcante MG, Campos EM, et al. Prevalence and factors associated with the generalized anxiety disorder among people living with HIV/AIDS in Brazilian outpatient clinics. *Rev Med UFC.* 2019 jul-set;59(3):32-38.