



RESEARCH ARTICLE

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## ADHERENCE TO ANTIRETROVIRAL MEDICINAL PRODUCTS IN THE GENERAL FIELDS REGION OF THE PARANÁ STATE – 2018

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### ABSTRACT

After the advent of antiretroviral therapy (ARVT), limited treatment options were no longer a problem and adherence to antiretrovirals became critical because of the need for good adherence for effective treatment. The study aimed at evaluating adherence to antiretroviral drugs in patients treated for HIV/AIDS. In the cross-sectional epidemiological study, the data were obtained through a socioeconomic questionnaire in order to characterize the population studied, and the instrument used to measure medication adherence was the CEAT-HIV. The result obtained was an average score of 76.2 in the adherence questionnaire, classified as “adequate adherence”. Significant influence of time without medication, occupational status, side effects, nausea and dizziness ( $p < 0.001$ ) were obtained. The variables Time without medication, Residence, Sexual Orientation and Side Effect were able to explain 26.94% of adherence to antiretroviral drugs in patients undergoing treatment for HIV/AIDS. The characterization and elucidation of adherence in individuals on ARVT facilitates the development of actions aimed at the most critical points in the medication adherence.

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## INTRODUCTION

Since the first HIV diagnosed case in 1982, over 70 million people have been infected with the HIV virus and there are more than 35 million deaths worldwide by 2015. According to the United Nations Joint Program on HIV, the UNAIDS (2016), there were approximately 36.7 million people living with HIV/AIDS, and of these, about 1.1 million died due to AIDS causes by the end of 2015, according to data from the World Health Organization – WHO (2016). Estimates indicate that there are approximately 18.2 million people on antiretroviral (ARV) treatment worldwide (UNAIDS, 2016). In 2015, in Brazil, there were about 830,000 people living with HIV and it is estimated that in 2015 there were 44,000 new cases of HIV infection. The number of deaths due to AIDS in 2015 was estimated at 15,000 (UNAIDS, 2016). Despite efforts by the Brazilian government to prevent HIV, infection continues to expand in the country. Although there is no cure to HIV infection, there are ARV drugs that slow the progression of the disease and can lead to a normal life expectancy (Suleiman and MOMO, 2016). After the advent of Antiretroviral Therapy ARVT, limited treatment options were

no longer a problem and adherence to ARVT came into focus due to the need for good adherence to the treatment effectiveness (Corless *et al.*, 2017). High levels of ARV adherence are needed to ensure greater benefits from viral suppression and the prevention of the emergence of drug resistance against HIV. The adherence to ARVT has been shown to be a predictor of increased CD4 counts, even in people who started treatment with low CD4 levels. In addition, adherence to ARVT has a consequent impact on public health, lowering community viral load, with decreased sexual, perinatal and injectable transmission of HIV (Mukui *et al.*, 2016).

Studies that seek to verify medication adherence, as well as to verify the influencing factors, are extremely important, since they help in the elaboration and implementation of more effective measures for the treatment of patients with HIV. Facing this scenario, the objective of this study was to identify the epidemiological, socioeconomic, demographic and clinical characteristics of patients living with HIV/AIDS on ARVT and to evaluate their adherence to antiretroviral drugs.

## METHODS

This is a cross-sectional epidemiological study, conducted at the Specialized Care Service and Counseling and Testing Center (SCS/CT), which is a reference in the treatment of HIV in the Campos Gerais region of Paraná state, composed by 13 towns. The selection of participants was made through direct approach of people living with HIV/AIDS who attended the SCS/CT, for medical consultation among December 2017 and June 2018. Data collection was performed by a convenience sample of 387 individuals, however 78 questionnaires were rendered unusable because they did not provide complete information. The socioeconomic variables of interest were obtained through a specific instrument elaborated by the authors. To evaluate medication adherence, the Brazilian version of the “Cuestionario para la Evaluación de la Adhesión al Tratamiento Antiretroviral (CEAT-VIH)” was used. It is a specific instrument for the population living with HIV/AIDS validated for the Brazilian population (Remor *et al.*, 2007). To describe the qualitative characterization variables the absolute and relative frequencies were used and to describe the quantitative characterization variables measures of central tendency, dispersion and position were used. In order to evaluate the factors that influenced Drug Adherence, Poisson Regression models with robust variance were adjusted. From the variables selected in the univariate analysis, a multivariate Quasipoisson Regression model was adjusted. The variables selected for the multivariate model considering the p-value to be less than 0.25 were: number of people living at home, time since diagnosis, time without medication (years), sex, residence, occupational status, sexual orientation, people who know about the diagnosis, side effect, condom usage, alcohol or drugs, and ARVT medications in use. The research project was approved by the Research Ethics Committee of the State University of Ponta Grossa, obtaining an opinion favorable to its realization under protocol number 79532017.4.0000.0105.

## RESULTS

The average age of the participants was 43 years old, with a minimum age of 18 years and a maximum age of 72 years. It was observed that 57.2% of the individuals were men and 73% declared to be heterosexual, the main way of transmission was sexual (88.2%). The average family income was 2.2 minimum wages, 45.7% studied until Elementary School and 40.6% reported having concluded High School, 39.5% were single and 32.7% married, 47.7% of individuals were employed. The average time since diagnosis was 8.6 years, the average time for ARVT was 7.3 years, 55.8% of PLHIV reported ingesting 03 or more pills a day and 90.6% reported not needing help on taking medication, the average time without taking the medication was 104.0 days. Table 1 presents the medication adherence “scores”. An average score of 76.2 can be verified, which is classified as “Adequate adherence” with a standard deviation of 8.6, with a minimum score of 33 (Low Adherence) and a maximum of 89 (Adequate Adherence). When asked about people in their social life know about their diagnosis, 52.7% of the individuals told someone about the HIV positive diagnosis. However, 59.9% of parents did not know the diagnosis of their children, 52.4% of the partners did not know the diagnosis, 65.0% of the patients' children did not know the diagnosis of their parents and 73.1% of the patients did not share the diagnosis with their friends. Multimorbidities were common in the participating population; 22.0% had some

other disease, the most frequently mentioned being hypertension (6.1% of individuals), diabetes (5.8% of participants) and depression (4,5%). It is also found that 25.9% of PLHIV reported using other medications, besides those related to ARVT, but could not inform the name of the medication used. Significant influence was observed over time without taking medication, and each year (365 days) that is added to the time without taking medication, the Medication Adherence decreases, on average, 4% (95% CI 95% 2 - 5;  $p < 0,001$ ). Occupational status was a factor that showed a significant difference ( $p < 0,005$ ) in Medication Adherence, and employed individuals had an average adherence 5% higher than unemployed ones. The presence of side effects showed significant differences for nausea and dizziness, respectively, in Medication Adherence, and individuals with nausea had an average adherence of 9% (CI 95% 5% - 13%;  $p < 0,001$ ) lower than those without nausea, and subjects with dizziness had a mean adherence 7% (CI 95% 2-12;  $p < 0,001$ ) lower than those without dizziness. Negative influence of Time without medication on Medication Adherence is observed, and every year (365 days) that is added to the time without taking medication, medication adherence decreases, on average, 3% (IC95% 2 - 4;  $p < 0,001$ ). Other variables that had significance on medication adherence were the place of residence, living in Ponta ( $p = 0.026$ ), gender ( $p = 0.013$ ) and side effects ( $p = 0.027$ ) (Table 2). Individuals living in Ponta Grossa had an average adherence 6% lower than those living in other cities. Homosexual participants had an average drug adherence 6% higher than heterosexual individuals. Individuals who reported nausea had an average adherence 7% lower than individuals who did not have nausea. Table 2 also shows that the variables time without taking medication, residence, sexual orientation and side effect were able to explain 26.94% of adherence to ARV medication of patients undergoing treatment for HIV/AIDS in the SCS/CT from Ponta Grossa, Paraná.

## DISCUSSION

The present study showed that PLHIV had an average age of 43 years, with a predominance of men, heterosexual and single. The main way of transmission was sexual. The average family income was 2.2 minimum wages, with predominance of elementary and high school. The average time since diagnosis was 8.6 years, the average time for ART was 7.3 years, most participants reported using 03 or more pills a day and were classified as “adequate” adherence. Other Brazilian studies corroborate with the results found here, which describe that most of the PLHIV are men in the age group of 43 to 59 years (Myada *et al.*, 2017; Menezes *et al.*, 2018; Silva *et al.*, 2014). The results of the studies show that regardless to the extensive Brazilian territorial area, the different cultural and social characteristics of the country's regions, similarity is still found in the distribution of the disease according to the age and gender. Worldwide, the HIV epidemic has been concentrated in the poorest population, which is most vulnerable by the social context, such as structural violence, social exclusion, and lack of access to appropriate health care services (Arrivillaga *et al.*, 2011; Pellini *et al.*, 2015; Motal *et al.*, 2018). Although studies indicate a higher frequency of men living with HIV/AIDS, there is an increase over time in case detection among women, which is described as feminization of the epidemic (Greco, 2016). The increase in the proportion of HIV/AIDS cases in people with less education has been called pauperization, considering in this context education as a marker of socioeconomic status.

**Table 1. Socioeconomic variables of diagnosis and medication adherence of people living with HIV undergoing treatment at the Specialized Care Service, Ponta Grossa – 2018**

Variables	n	Average	S.D.	Minimum	1 <sup>st</sup> Q	2 <sup>nd</sup> Q	3 <sup>rd</sup> Q	Maximum
Age	302	43,81	11,87	18,00	35,00	44,00	53,00	72,00
Family income (in minimum wages)	265	2,22	2,43	0,00	1,00	1,50	2,80	30,00
People living at home	295	2,79	1,35	0,00	2,00	3,00	3,50	7,00
Time of diagnosis (in years)	293	8,57	6,70	0,10	3,00	7,00	14,00	32,00
ART time (in years)	245	7,31	6,05	0,00	2,00	6,00	12,00	28,00
Hospital internment	256	0,53	2,21	0,00	0,00	0,00	0,00	28,00
Time without taking medication (in days)	163	104,01	473,51	1,00	1,00	2,00	7,00	4380,00
Punctuation of adherence	309	76,19	8,57	33,00	72,00	78,00	82,00	89,00

**Table 2. Multivariate model of socioeconomic variables that influence medication adherence of people living with HIV on antiretroviral treatment at the Specialized Care Service, Ponta Grossa – 2018**

Variables	Initial Model			Final Model		
	Exp(β)	C.I.- 95%	P-value	Exp(β)	C.I.- 95%	P-value
People living at home	1,00	[0,98; 1,01]	0,690			
Diagnostic Time	1,00	[0,99; 1,00]	0,392			
Time without taking medication (years)	0,98	[0,96; 1,00]	0,046	0,97	[0,96; 0,98]	< 0,001
Gender = Female	1,00	-	-			
Gender = Male	0,98	[0,93; 1,04]	0,495			
Residence = Others	1,00	-	-			
Residence = Ponta Grossa	0,94	[0,89; 1,00]	0,074	0,94	[0,89; 0,99]	0,026
Occupational situation = Unemployed	1,00	-	-			
Occupational situation = Employed	1,00	[0,95; 1,06]	0,991			
Occupational situation = Others	0,98	[0,92; 1,05]	0,640			
Sexual orientation = Heterosexual	1,00	-	-	1,00	-	-
Sexual orientation = Homosexual	1,08	[1,01; 1,15]	0,021	1,06	[1,01; 1,12]	0,013
Sexual orientation = Others	1,02	[0,89; 1,16]	0,793	1,02	[0,9; 1,15]	0,759
People who told parents the diagnosis = No	1,00	-	-			
People who told parents the diagnosis = Yes	0,98	[0,93; 1,02]	0,285			
Nausea = No	1,00	-	-	1,00	-	-
Nausea = Yes	0,95	[0,87; 1,03]	0,223	0,93	[0,88; 0,99]	0,027
Dizziness = No	1,00	-	-			
Dizziness = Yes	1,02	[0,92; 1,12]	0,757			
Condom use = No	1,00	-	-			
Condom use = Yes	1,01	[0,96; 1,07]	0,656			
Alcohol or drugs = No	1,00	-	-			
Alcohol or drugs = Yes	0,98	[0,92; 1,03]	0,399			
McFadden's pseudo R-squared	21,11%			26,94%		

Poor education may result in impaired adherence, even interfering in therapeutic understanding, due to difficulties in interpreting the information provided by the health team and in recognizing the importance of performing the treatment correctly (King *et al.*, 2012). Due to the advent of antiretroviral therapy, the prognosis for human immunodeficiency virus infection has been improved. The evolution of therapy to a less complex, safer, easier to administer regimen, which has fewer side effects and allows control of viral replication in most adherent patients, leading to increased survival and decreased opportunistic infections (Pinheiro *et al.*, 2016; Tancredi and Waldman, 2014). The description of unsatisfactory results regarding to adherence to ARVT in research conducted in Brazil is a problem observed by other authors. In a study conducted in São Paulo by Miyada *et al.* (2017), the authors describe insufficient antiretroviral adherence. Menezes *et al.* (2018) indicate 80.7% of PLWHA as average adherence. Failures in ARVT lead to increased viral load and may lead to resistance as well as decreased future therapeutic options. The results obtained in this research could be partially explained by the service structure of SCS/CT of Ponta Grossa, which has a multidisciplinary team composed by doctors, pharmacists, psychologists, social worker, physical and equipment structure, as well as of access facilitated by being headquartered in the center of the city with nearby central terminal and logistic structure of transport of the municipalities of the region to the service. Multidisciplinary teams make up the basic SCS/CT teams in Brazil (Ministry of

Health, 2017). However, the literature records that interdisciplinary work may or may not be performed by multiprofessional teams. And when properly performed, it is most effective in monitoring people with chronic conditions (Ojikutua *et al.*, 2014; Davis *et al.*, 2017). And this is the practice of the service studied, which would have ensured greater co-responsibility of care subjects and autonomy for team professionals to practice new interdisciplinary modes of care. Another possibility for high adherence to ARVT would be a measurement bias since the evaluated adherence was self-reported. However, most studies that also evaluate adherence obtained information in the same way, including using the same questionnaire used in the present research. Moreover, it is questioned that since the users of the SCS/CT service mostly workers and / or pensioners (60%), this population could adhere to the treatment to be active and productive. In the present study, the negative influence of time without medication on medication adherence was observed. Holstand *et al.* (2006) suggest that patients who have lived longer with the disease may have learned what to do for a living, how to adapt, and how to manipulate their medication regimen to maintain their health. It is concluded that through medication adherence evaluation, it is possible to identify patterns and behaviors related to medications in the studied population. The characterization and elucidation of adherence in individuals on ARVT facilitates the development of actions aimed at the most critical points in the medication adherence, thus implementing individualized and effective measures. It is important to

emphasize that the level of medication adherence observed is definitive and may vary over time, since HIV is a chronic disease, adherence monitoring studies are important to be performed in order to verify potential problems, enabling health professionals to health plan strategies to avoid them. Thus, one of the challenges to developers and implementers of public health policies is to understand how different factors influence patient adherence in order to establish effective actions, according to the characteristics of the population.

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