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**Journal of Happiness Studies**

An Interdisciplinary Forum on  
Subjective Well-Being

ISSN 1389-4978

Volume 21

Number 7

J Happiness Stud (2020) 21:2405-2417

DOI 10.1007/s10902-019-00182-y

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# Treatment Adherence, Meaning in Life and Affects in Quality of Life of HIV/AIDS Patients

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Published online: 11 October 2019  
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## Abstract

The objective of this study is to identify the predictors of the QOL's domains, specifically, to understand the relationship between biological markers, psychological variables and QOL of HIV/AIDS patients. Cross-sectional developed with 94 individuals with HIV/AIDS, who attend the outpatient clinic specialty and have had an antiretroviral prescription for 3 months. WHOQOL-Bref (QOL), CEAT-VIH (treatment adherence), Meaning in life scale (ML) and PANAS (affects), and sociodemographic and clinical questionnaire. The results of the predictive models of the QOL's domains, when controlling for the viral load and the CD4+T cell count, encompass affect balance, treatment adherence and meaning in life with the highest explained variance in the predictive models of QOL in physical 37.4% and psychological 33.9% domains. The affect balance is a predictor of all QOL's domains and treatment adherence is a predictor of three of them. ML is a predictor of the psychological and environmental domains. This study emphasizes the importance of affect balance, treatment adherence and meaning in life for the QOL in HIV.

**Keywords** Quality of life · Treatment adherence · Meaning in life · Affect balance HIV/AIDS

## 1 Introduction

Recent data estimates that about 65 million have been infected with HIV and AIDS has already killed more than 25 million people worldwide since it was first identified in 1981. The vast majority of the 38.6 million people living with HIV in 2005 are unaware of their condition. AIDS is today one of the most serious development-related and security-related diseases facing the world (UNAIDS 2019). The concern with the quality of life (QOL) of

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HIV/AIDS patients became accentuated with the introduction of the *highly active therapy* back in 1996. With the help of these new treatments, people started to live longer and with more quality of life (Ciesla and Roberts 2001).

Several studies have focused on the relationship between psychosocial stress and the clinical progression of HIV/AIDS (Chida and Vedhara 2009), but there are inconsistencies in the results. However, it is known that the people living with HIV/AIDS deal with the social stigma of the condition, with HIV-associated pathologies and with the eminence of death, which may make them more likely to develop depressive symptoms or other emotional changes (Ciesla and Roberts 2001; Gonzalez et al. 2011).

Combination antiretroviral therapy (ART) has changed HIV condition from a fatal and terminal disease to a chronic condition in countries where treatment is available (Cooper et al. 2017). In this sense, individuals with HIV/AIDS must implement new patterns of life due to their permanent care necessities, which include a high level of adherence to ART, this being one of the greatest challenges given that the stability of the condition depends on it (Gonzalez et al. 2011). The systematic review by Beard et al. (2009) shows that due to the effectiveness of ART a large reduction in mortality and morbidity rates in HIV/AIDS patients has been observed, as well as an increase in QOL (Cardona-Arias and Higuera-Gutierrez 2014).

Quality of life is a multidimensional concept oriented towards the understanding of individual perception on the well-being and level of functionality in different dimensions: physical, psychological, social relations, environment, spirituality and functionality (WHOQOL Group 1998). This is an important concept in the context of HIV/AIDS Infection associated with the clinical course of the disease and treatment adherence (Cooper et al. 2017).

Some studies suggest that there are several variables that are able to influence the association between treatment adherence and QOL, such as sociodemographic variables (gender, age, being employed, being in a relationship), clinical variables (CD4 cell count and viral load, time since the diagnosis and treatment adherence) and personality variables (Rzeszutek and Gruszczynska 2018). However, the study conducted by Rzeszutek and Gruszczynska (2018) did not find any association between clinical variables and QOL's dimensions, but two sociodemographic variables: being in a relationship and being employed, were significantly correlated to QOL's dimensions, although the relationship was weak. The authors suggest that the absence of association between the clinical variables and QOL can probably be explained by ART advances that enable people with HIV/AIDS to live longer, with greater possibility of adaptation and disease management and consequently with greater QOL (Rzeszutek and Gruszczynska 2018).

Other studies verified positive associations between treatment adherence and QOL (Degroote et al. 2014; Reis et al. 2010). Skevington et al. (2004) and WHOQOL Group (1998) found an association between QOL and disease severity, with lower CD4 count had lower QOL, both measure QOL with WHOQOL-Bref (cit. Cooper et al. 2017).

Scientific evidence points to variables that can influence QOL in HIV/AIDS as it is the case of the biological markers of the illness—viral load and CD4 + T cells (Schroecksnadel et al. 2008). Reis et al. (2013a) observed that viral load presented differences in all QOL's domains, having obtained higher scores in individuals with inferior viral load, with exception to the social relationships domain.

The influence of the CD4+T cell count in QOL does not present consensual results (Cooper et al. 2017). A study by Reis et al. (2010) revealed that the CD4+T cell count does not have influence on most of the QOL's domains assessed through the WHOQOL-Bref with exception to the psychological domain. Interestingly, in a later study by Reis

et al. (2013b), using the same instrument to assess QOL and considering four comparative groups of CD4+ T cell count (<200; 200–350; > 350 < 500; > 500), differences were observed in all domains, with exception to the psychological domain.

Meaning in life is another variable that can influence QOL. For meaning in life to be experienced three aspects must be present: purpose, meaning and sense made (Heintzelman and King 2014). Meaning in life and its relationship with other variables, namely QOL, has been mostly disclosed in individuals with cancer (e.g. Guerra et al. 2017; Jim et al. 2006) and less studied in the HIV/AIDS. Some authors refer that meaning in life is associated with a better perception of QOL in multiple sclerosis (Pinto and Guerra 2018) and with less prevalence of depression (Park et al. 2010). In a recent study by Audet et al. (2015) meaning in life is positively correlated with QOL in HIV/AIDS patients.

The affects have been studied as influents in QOL in individuals with disease (Denvir et al. 2006; Spindler et al. 2009; Stauber et al. 2013), and in healthy individuals (Spindler et al. 2009). The positive affects represent a stable indicator of the emotional experience and the negative affects reflect a more global dimension associated to distress (Li et al. 2017).

Literature review enhances the role of treatment adherence and positive and negative affect for QOL in HIV (Degroote et al. 2014; Reis et al. 2010, 2013b); however, the role of meaning in life is not so well documented in this pathology.

To sum up, there are studies about the relationship between meaning in life and QOL in other pathologies (e.g. Pinto and Guerra 2018), however, in AIDS there is only one (Audet et al. 2015) that indicates that the higher the experience of meaning in life, the more QOL. In these studies, positive affects are associated with a better perception of QOL (e.g. Stauber et al. 2013). In the light of these studies, we therefore hypothesize that this positive relationship between affects, meaning in life and QOL, may also be found in the HIV/AIDS infection, using simultaneously meaning in life and affect as predictors of QOL. In relation to the clinical variables and the therapeutic adherence in QOL, there are studies (Reis et al. 2013a; Schroecksnadel et al. 2008) that show that their influence is significant.

Considering the psychological requirements that are presented to HIV patients, this paper intends to understand the role of some biological markers (CD4 cell count and viral load) and indicators of psychological adaptation like treatment adherence, meaning in life and affect balance as predictors of the different QOL's domains (physical, psychological, social relationships and environmental) in the HIV/AIDS infection.

## 2 Method

### 2.1 Participants

Table 1 presents the sociodemographic and clinical characterization of the participants. The sample is heterogenic, with an age interval of 20–70 years old, and presents a mean age of 40 years old (39.7). 56.4% are male individuals and 47.9% are single. Regarding schooling, most individuals have a low level of schooling, 26.6% completed elementary school and 30.9% completed middle school. Regarding the occupational variable, 42.6% of the individuals are unemployed and 31.9% are professionally active.

Concerning the clinical variables, it is possible to observe that 58.5% refer to the heterosexual sexual route as the means of HIV transmission and 33% to injectable drugs. Considering the stage of infection (classification CDC 1993) it was decided to standardize the

**Table 1** Characterization of the participants according to sociodemographic and clinical characteristics (N=94)

	M	SD	Min	Max	N	(%)
Age	39.7	8.11	20	70		
Gender						
Male					53	56.4
Female					41	43.6
Marital status						
Single					45	47.9
Married					24	25.5
Cohabiting					15	16.0
Separated					2	2.1
Divorced					6	6.4
Widow					2	2.1
Schooling						
No schooling					2	2.1
Elementary school					25	26.6
Middle school					29	30.9
High school					21	22.3
Secondary education					12	12.8
Higher education					4	4.3
Other					1	1.1
Occupation						
Active					30	31.9
Unemployed					40	42.6
Retired					11	11.7
Other					13	13.8
<i>Clinical variables</i>						
Infection route						
Homosexual					6	6.4
Heterosexual					55	58.5
Injectable drugs					31	33.0
Contact with blood					2	2.1
CDC						
A1					63	67.0
A2					10	10.6
A3					20	21.3
C1					1	1.1
Time of HIV + diagnosis (months)	91.5	55.7	8	252		
Time of treatment (months)	55.6	44.6	3	163		
Viral load (copies/ml)	10,671	54,556.7	20	50,000		
Lymphocytes CD4 + T	451	301.8	8	1556		

criteria and use the classification adopted when completing the investigation protocol in 2010. We verified that the stages with the most number of subjects was A1 (asymptomatic) representing 67%, followed by A3 (criteria of the AIDS phase) with 21.3%. Regarding the

clinical data of the HIV/AIDS infection, it was observed that the mean values of viral load of HIV are 10,671 copies of ARN ( $SD=54,556.7$ ) and the minimum is  $<20$  (current detection threshold criteria). For the CD4+T lymphocyte count, the mean value found was 451 CD4+T ( $SD=301.8$ ).

## 2.2 Instruments

*Questionnaire of Sample Characterization* The questionnaire consists of questions of closed response and is divided into two parts, the first regards data collection about individual characteristics and the second to the characterization of the clinical profile.

*Quality of Life—WHOQOL-Bref* by Vaz Serra et al. (2006) is a reduced version of the WHOQOL-100 to assess QOL and is validated for the Portuguese population. The WHOQOL-Bref is organized in four domains: Physical, Psychological, Social Relationships and Environmental and consists of 26 questions, two of which refer to global quality of life (Fleck 2006). In the present sample, we found good indices of internal consistency: physical domain  $\alpha=0.79$ , psychological domain  $\alpha=0.75$ , social relationships domain  $\alpha=0.78$ , and environmental domain  $\alpha=0.81$ .

*Treatment Adherence—Cuestionario para la Evaluación de la Adhesión al Tratamiento Antirretroviral (CEAT-VIH)* by Remor (2002) adapted for the Portuguese population by Reis, Lencastre, Guerra and Remor (2009) is a questionnaire of ART treatment adherence. It is of multidimensional character, of self-administration and was developed for HIV adult individuals. It consists of 20 items based on a specialized literature review and on the clinical experience of HIV/AIDS carriers. The total score is obtained by the sum of all the items. A higher score is related to higher degree of adherence. In the present sample, we found good indices of internal consistency ( $\alpha=0.87$ ).

*Meaning in Life—Meaning in Life scale* of Guerra et al. (2017) consists of 7 items, with responses using a likert scale. The score of each question varies between 1 and 5 and the total score can vary between 7 and 35. In the present sample, an internal consistency of 0.75 was obtained.

*Positive and negative affects—Positive and Negative Affect Schedule PANAS* in the adapted version for the Portuguese population by Galinha and Ribeiro (2005). The PANAS consists of 20 items divided into two dimensions: 10 positive and 10 negative emotions. The internal consistency was as follows: Cronbach alpha for the positive affect scale  $\alpha=0.91$  and for the negative affect scale  $\alpha=0.87$ , which were similar to the results of the original scale (Galinha and Ribeiro 2005).

In this study, a measure called *affect balance* was used in consonance with the guidelines of Koydemir et al. (2013), that is obtained by subtracting the score of the negative affects from the score of the positive affects.

## 2.3 Procedure

The data collection occurred in two hospitals specialized in Infeciology (Porto and Lisbon). The study was approved by the hospitals Ethics Committee and received subsequent authorization from the board of directors (it was also approved by the National Commission of Data Protection). After the informed consent was obtained, the participants answered the investigation protocol at the end of the consultation of the speciality in the presence of a psychologist who worked at the hospital and was part of the research team.

To minimize missing values or no answers, the questions were read out. For the statistical treatment of the data, the IBM SPSS version 24 was used.

### 3 Results

In this section we begin by presenting the descriptive statistics of the instruments used, followed by the relationship between meaning in life, treatment adherence, affect balance, biological markers and quality of life and last, the predictor models of the QOL domains.

In reference to the descriptive statistics of the instruments, the results are presented in Table 2. In regards to the WHOQOL-Bref, we were careful to compare our results with those of a healthy population (Vaz Serra et al. 2006) and verified that the HIV positive individuals presented inferior values in all the domains of QOL, with the differences being statistically significant ( $p < 0.001$ ). Regarding the meaning in life, the mean of the participants in this study is inferior to the mean of a healthy population (Guerra et al. 2017), suggesting that the participants with HIV/AIDS report less meaning in life ( $p < .001$ ). Regarding treatment adherence, the levels of adherence found in this study are superior to those of the participants from the study of the original version of the CEAT-VIH instrument (Remor 2002). And last, regarding the affect balance, we compared the dimensions of which it is composed—positive and negative affects—with the general population and verified that the participants with HIV/AIDS that presented less experience with positive and negative affects ( $p < .001$ ).

In regards to the relationships between variables, Table 3 presents the associations between meaning in life, treatment adherence, affect balance and QOL's domains. In this table we can verify that all QOL's domains are correlated positively and significantly with treatment adherence, with meaning in life and with affect balance. Higher correlations are found between the physical, psychological and social QOL's domains and affect balance, as well as between the physical and psychological domains of QOL and treatment adherence.

**Table 2** Descriptive statistics for meaning in life, treatment adherence, affect balance and QOL and comparison with healthy population

Variables	Min	Max	Mode	Median	M	DP	Healthy popu- t		p	
							M	DP		
<i>WHOQOL-BREF</i>										
Physical	29	100	64	67.86	67.55	16.73	77.49	12.27	-5.76	<.001
Psychological	25	96	58	62.50	47.63	12.71	72.38	13.50	-5.74	<.001
Social relationships	0	100	56	57.81	53.46	21.77	70.42	14.54	-7.55	<.001
Environmental	22	91	56	57.81	58.61	16.05	64.89	12.24	-3.79	<.001
Treatment adherence <sup>a</sup>	45	88	80	77	74.79	9.03	73.0	5.1	1.92	0.06
Affect balance	20	33	12	12	10.26	10.44				
Positive affect	10	46	26.0	28.0	27.74	9.04	32.0	7.0	-4.56	<.001
Negative affect	10	39	11	15.50	17.49	7.02	19.5	7.0	-2.78	<.001
Meaning in life	15	35	26	24	24.20	3.91	28.10	3.93	-9.67	<.001

<sup>a</sup>In case of treatment adherence, results are compared with a population with HIV/AIDS

**Table 3** Pearson's correlation coefficients between meaning in life, treatment adherence, affect balance and QOL

QOL	Adherence	Meaning in life	Affect balance
Physical	$r=0.491^{**}$	$r=0.265^{**}$	$r=0.633^{**}$
Psychological	$r=0.534^{**}$	$r=0.360^{**}$	$r=0.454^{**}$
Social relationships	$r=0.347^{**}$	$r=0.299^{**}$	$r=0.640^{**}$
Environmental	$r=0.466^{**}$	$r=0.343^{**}$	$r=0.407^{**}$

\*\* $p < 0.01$

By analysing the correlations of the psychological domain with the other variables, and specifically looking at each of the items of this domain, we verified that there is one item that could be overestimating the result of the relationship with affect balance ( $r=.69$ ) given the similarity of its content in terms of negative affects. We therefore considered removing this item (item 26) from the psychological domain of the WHOQOL-Bref. Regarding the correlation of the psychological domain of the WHOQOL-Bref with meaning in life, we also found an item (item 6), that would be overlapping with some of the content from the instrument that measures meaning in life and so we decided to remove this item, as well from the psychological dimension of the QOL. The correlations of the psychological domain of QOL were redone (without items 6 and 26) with the other psychological variables (treatment adherence, affect balance and meaning in life) and the following values were altered: affect balance changed from  $r=.69$  to  $r=.46$ , meaning in life changed from  $r=.37$  to  $r=.36$ , and adherence changed from  $r=.546$  to  $r=.534$ , however, all the values continued to be significant ( $p < .001$ ). The analysis of the internal consistency of the psychological dimension of the WHOQOL-Bref was recalculated without items 6 and 26 and maintained a good reliability with the alpha changing from 0.75 to 0.72.

The CD4+T cell count did not correlate with any QOL's domains. No statistically significant association was found with viral load and the social relationships domain. Some QOL's domains correlated negatively with viral load particularly in the physical domain ( $r=-0.28$ ,  $p < 0.01$ ), psychological ( $r=-0.31$ ,  $p < 0.01$ ) and environmental ( $r=-0.24$ ,  $p < 0.05$ ). Yet, a weak association was verified between viral load and CD4+T cells ( $r=-0.23$ ,  $p < 0.05$ ).

For the study of the predictive models of QOL in HIV/AIDS infection, and in order to exclude the possibility of multicollinearity between all variables, we verified that among the possible independent variables to be introduced in the equation, there were no correlations above  $r=0.80$  (Pallant 2011). Based on these assumptions the following variables could be included in the model as psychological variables—treatment adherence, meaning in life, affect balance. It was also decided to include viral load and CD4+T given their negative associations in this study and their relevance in the association with treatment adherence as suggested in previous literature (Reis et al. 2013a). Multiple hierarchical regression was performed (first block: biological markers of the HIV/AIDS infection—viral load and CD4+T thus controlling the effects of these variables in the prediction of the remaining ones to be introduced in the second model equation: treatment adherence, meaning in life, affect balance).

Next the predictive models for each of the QOL's domains are presented.

The predictive model for the physical domain of QOL in HIV/AIDS infection is presented in Table 4. In this table we can verify that the predictive variables of the physical domain of QOL are affect balance and treatment adherence. These two variables, taken together, explain 37.4% of the total variance of the physical domain of QOL, making the

**Table 4** Predictive model of QOL—physical domain in HIV/AIDS infection

Variables	Model		
	$\beta$ standardized	t	p
Viral load	-0.274	-2.65	<b>0.01</b>
CD 4 + T	0.002	0.290	0.77
$R^2$	0.08		
$R^2$ change	0.08		
F	3.93		<b>0.02</b>
Meaning in life	0.06	0.774	0.441
Affect balance	0.511	5.55	<b>&lt;0.001</b>
Treatment adherence	0.253	2.53	<b>0.013</b>
$R^2$	0.46		
$R^2$ change	<b>0.37</b>		
F	15.43		<b>&lt;0.001</b>

Bold values indicate the statistical significance

present model significant after controlling for the effect of the variables of viral load and CD4 + T. Analysing each predictor individually we verify that the affect balance represents the factor that best explains and predicts the physical domain of QOL, presenting the largest contribution.

The predictive model for the psychological domain of QOL in HIV/AIDS infection is presented in Table 5. We can verify that the predictors of the psychological domain of QOL are—treatment adherence, affect balance and meaning in life. These three predictive variables, taken together, explain 33.9% of the total variance in the psychological domain of QOL, making the model presented significant after controlling for the effect of the viral load and CD4 + T variables. Analysing each predictive variable individually we verify that the treatment adherence represents the factor that best explains and predicts the psychological domain of QOL, having therefore, the largest contribution. The affect balance is the

**Table 5** Predictive model of QOL—psychological domain in HIV/AIDS infection

Variables	Model		
	$\beta$ standardized	t	p
Viral load	-0.303	-2.958	<b>0.004</b>
CD 4 + T	0.014	0.134	0.894
$R^2$	0.094		
$R^2$ change	0.074		
F	4.72		<b>0.011</b>
Meaning in life	0.189	2.120	<b>0.037</b>
Affect balance	0.220	2.237	<b>0.028</b>
Treatment adherence	0.380	3.538	<b>&lt;0.001</b>
$R^2$	0.374		
$R^2$ change	<b>0.339</b>		
F	10.528		<b>&lt;0.001</b>

Bold values indicate the statistical significance

**Table 6** Predictive model of QOL—*social relationships* domain in HIV/AIDS infection

Variables	Model		
	$\beta$ standardized	t	p
Viral load	-0.081	-1.214	0.455
CD 4+T	0.047	0.926	0.631
$R^2$	0.03		
$R^2$ change	0.03		
F	1.50		0.23
Meaning in life	0.178	1.816	0.07
Affect balance	0.315	2.902	<b>0.005</b>
Treatment adherence	0.173	1.461	0.148
$R^2$	0.24		
$R^2$ change	<b>0.21</b>		
F	5.56		<b>&lt;0.001</b>

Bold values indicate the statistical significance

**Table 7** Predictive model of QOL—*environmental* domain in HIV/AIDS infection

Variables	Model		
	$\beta$ standardized	t	p
Viral load	-0.24	-2.112	<b>0.026</b>
CD 4+T	0.02	0.166	0.87
$R^2$	0.06		
$R^2$ change	0.06		
F	2.83		0.07
Meaning in life	0.20	2.112	<b>0.04</b>
Affect balance	0.21	1.992	<b>0.05</b>
Treatment adherence	0.33	2.922	<b>0.004</b>
$R^2$	0.30		
$R^2$ change	<b>0.24</b>		
F	7.58		<b>&lt;0.001</b>

Bold values indicate the statistical significance

second predicting factor in the psychological domain of QOL and meaning in life the third predicting factor.

The predictive model in the social relationship domain of QOL in HIV/AIDS infection is presented in Table 6. In this Table we can verify that the predictive variable in the social relationships domain of QOL is the affect balance. The predictive variable explains 21% of the total variance in the social relationships domain of QOL, making the predictive model presented significant.

The predictive model in the environmental domain of QOL in the HIV/AIDS infection is presented in Table 7. We can verify that the predictive variables of the environmental domain of QOL are: treatment adherence, affect balance and meaning in life. The three predictive variables taken together explain 24% of the total variance of the environmental domain of QOL, making the presented model significant after controlling for the effects of

the variables of viral load and CD4 + T. Analysing each predictive variable individually we verify that the treatment adherence represents the factor that best explains and predicts the environmental domain of QOL, having the largest contribution. The meaning in life is the second predicting factor in the environmental domain of QOL and affect balance the last predicting factor.

## 4 Discussion

The main objective of this study was to identify the determinants for the QOL's domains in the HIV/AIDS infection, searching to comprehend the existing relationship between biological markers, treatment adherence, meaning in life and affect balance and QOL. The instrument used in this research to assess QOL was the WHOQOL-Bref, also used in others studies previously mentioned (e.g. Cooper et al. 2017; Reis et al. 2013a).

Regarding to the biological markers of the HIV/AIDS infection, and more specifically the viral load, we verified that it does influence QOL, with exception to the dimension of social relationships. Reis et al. (2013a) had found a similar result in the study where they used a cutting point of 20 copies per ml/blood for viral load. In all QOL's domains, the existence of statistically significant differences in the perception of QOL regarding viral load was verified, with exception also to the dimension of social relationships. In this study, the CD4 + T count did not influence QOL as had been previously demonstrated in 2010 by Reis and collaborators with exception to the psychological domain. Interestingly in the study of Reis et al. (2013a) all the domains were affected with the exception to the psychological, using four comparative groups regarding the CD4 + T cell count.

The recent combined therapeutics have altered the status of the disease to a chronic disease and not necessarily fatal, emphasises the importance for the HIV/AIDS carrier to have a good QOL (Cooper et al. 2017), a fact that is evident in this study. In the study by Reis et al. (2010), there were positive and statistically significant correlations between treatment adherence and all the QOL's domains. Treatment adherence is present as a predictor of all the domains of QOL, except in social relationships. In a study developed by Liping et al. (2015), with a Chinese population, they found similar results in the prediction of QOL for the physical and environmental domain. Interestingly, only the psychological domain was not predicted by treatment adherence, whereas in the present study it was in the social relationships domain that treatment adherence did not have a contribution. We therefore consider that adherence is not determinant in the social domain of QOL, as it can both favour or harm it, depending on various factors, such as, among others, the secondary effects of the drugs and the therapeutic schema (Parianti et al. 2009; Reis et al. 2013a). Although the therapeutic regime is directed towards a single take, there are still some HIV carriers with more complex therapeutic regimes and deal with the secondary effects of these.

Regarding the role of meaning in life and its predictive value, we verified that it explains the psychological and environmental domains of QOL. The results of other studies point out the fact that the carriers of HIV that are able to find meaning in life and a purpose despite their disease, can achieve better psychological adjustment and live in harmony (Balthip 2010). It is important to refer as well that there is a relationship between the presence of meaning in life and better treatment adherence and perception of QOL (Audet et al. 2015; Balthip and Purnell 2014), findings that are consistent with the present study. Meaning in life is a concept that explores the motivation for achieving objectives and lead one to that end. In the pursuit of these objectives, the relationship between meaning in life and the

QDV environment, becomes clear, especially if the environment is conducive and provides the contextual resources (e.g., social and health care, opportunities to acquire skills) for the achievement of the objectives. The psychological dimension that portrays the positive and negative feelings, self-esteem, among others, also have a direct relationship with meaning in life, how the individual sees themselves, and how they try to progress. This is why positive feelings and higher self-esteem are associated with better meaning in life.

The affect balance is a predictor of all QOL domains and is frequently associated to a better health condition and well-being, with positive consequences in the perception of QOL (Li et al. 2017).

The affect balance is a measure that translates wellbeing and emphasizes the predominance of positive affects over the negative ones, and therefore it is no surprise to have found these results, given there are studies in other pathologies that suggest the importance of positive affects for a better perspective of QOL in its different domains (Guerra et al. 2017; Stauber et al. 2013).

## 5 Strengths and Limitations

We consider this study to have contributed to the literature on the variables associated with a better psychological adaptation to the HIV/AIDS disease, emphasizing the role of affects, treatment adherence and meaning in life in the QOL of those infected with HIV. We highlight the innovative character of this study in regards to the level of association found, specifically between affect balance and QOL. There are still no studies that focus on understanding the role of variables such as meaning in life and affect balance in association with QOL in patients, and so we believe that the positive psychological variables studied here added an additional explanation regarding the perception of QOL in HIV/AIDS patients.

Despite this contribution, we cannot leave out the reference that the present study presents some limitations as it is a cross sectional study and uses a small sample ( $n=94$ ), which limited the number of variables to include in the predictive models of the different QOL's domains. We would like to suggest further longitudinal studies in order to clarify the relationship between the considered variables.

## 6 Conclusion

We would like to conclude by affirming that the HIV/AIDS carriers are today not condemned to physical death, given the advance of ART, nor to social death, as they are able to live similar day-to-day experiences as any other person (Ciesla and Roberts 2001; Cooper et al. 2017; Rzeszutek and Gruszczynska 2018). This study contributes with the findings that affect balance is a predictor of all QOL domains. Treatment adherence is a predictor of all the QOL domains with exception to the social relationships. Meaning in life is a predictor of psychological and environmental domains and is associated with all QOL domains. This fact reinforces the role of meaning in life in HIV/AIDS, to promote a better QOL, as previously verified in just one study in HIV (Audet et al. 2015) and other health conditions (e.g. Guerra et al. 2017).

Some final considerations deserve relevance for health care professionals confronted everyday with the difficulties of HIV/AIDS carriers in managing the implications of the disease in their life. The health care professional must be able to adopt an empathic

approach, of trust and proximity with the individual considering their biopsychosocial profile. It is important to create a secure environment that allows the individual to express their motivations and meaning in life and the sharing of the day-to-day aspects so that they do not compromise the effectiveness of the treatment adherence emphasising the feeling of positive emotions in parallel to promote QOL in HIV/AIDS carriers.

**Acknowledgements** We wish to thank all the patients who made this study possible.

**Funding** This work was funded by the Center for Psychology at the University of Porto, Portuguese Science Foundation (FCT UID/PSI/00050/2019).

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