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**Articles**

# Psychological Distress in a Population of People Living with HIV/AIDS in Nigeria: Association with Socio-demographics and Perceived Social Support

*Adetunji Obadeji [1, 2] *, Lateef Olutoyin Oluwole [1, 2], Banji Ferdinand Kumolalo [2], Kehinde Oyeyemi Oderinde [3], Adedotun Samuel Ajiboye [2], Christopher Goson Piwuna [4]*

## Abstract

*Background:* Recent improvement in the care of People living with HIV/AIDS (PLHA) continues to change the face of HIV infection from a deadly disease to a chronic illness with attendance psychological sequelae. The objective of this present study was to examine the rate of psychological distress (PD), and its association with socio-demographics and perceived social support among PLHA.

*Methods:* This cross-sectional study was conducted among a population of PLHA in Ado-Ekiti, Nigeria. Participants completed a socio-demographic questionnaire, the Multidimensional Scale of Perceived Social Support (MSPSS), and the 10-item Kessler Psychological distress scale. Relationship between sociodemographic variables, social support and PD were examined using bivariate and multivariate analyses.

*Results:* Of 324 participants, 26.5% were experiencing PD. Being a female, unemployed, having no spouse, no post-test counseling or non-disclosure of status increases the odds of developing PD while the absence of complications significantly reduces the risk of developing psychological distress [OR=0.31 (95% CI: 0.17-0.56), AOR=0.20 (95% CI: 0.09-0.45)]. There was a significant negative correlation between PD and MSPSS (r= -0.116, p=0.037) and its Significant others subscale (r= -0.276, p=0.001).

*Conclusions:* The study findings emphasize the importance of enhancing social support systems for people living with HIV/AIDS in a bid to reduce psychological distress. Similarly, disclosure of illness and ensuring post-test counseling are essential in preparing PLHA to cope effectively after testing. Incorporating psychological assessment as well as care for PLHA will go a long way in improving treatment outcomes.

[1] Department of Psychiatry, College of Medicine, Ekiti State University, Ado-Ekiti, Nigeria

[2] Department of Psychiatry, Ekiti State University Teaching Hospital, Ado-Ekiti, Ekiti State, Nigeria

[3] University of Benin Teaching Hospital, Benin, Nigeria

[4] Department of Psychiatry, Faculty of Medicine, University of Jos, Jos, Plateau State, Nigeria

E-mail corresponding author: doctunjioba@yahoo.com

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## 1. Introduction

Despite advances in the care of people with HIV/AIDS, it continues to elicit a detrimental effect on both the physical as well as psychosocial health with an attendant negative effect on the bearer. With the discovery of Highly Active Antiretroviral Therapy (HAART), people living with HIV/AIDS (PLHA) appears to be overcoming the fear of what previously appeared to be a death sentence (Johnson et al., 2013). Despite the improvement in life expectancy resulting from improved care (Antiretroviral Therapy Cohort Collaboration, 2008; Brennan et al., 2011), PLHA still experience significant physical (arising from the illness or the adverse effect of antiretroviral drugs), myriads of psychological and social (arising from the illness or stigma and discrimination) sequelae/challenges that are multiple and chronic in nature (Adams et al., 2016; Rasoolinajad et al., 2018; Travaglini et al., 2018). These challenges may lead to notable psychological disturbances such as anxiety, depression, substance misuse or use disorders, psychosis and/or other HIV/AIDS-risky behaviors (Camara et al., 2020; Chaudhury et al., 2016; Duko et al., 2019; Obadeji et al., 2014; Vreeman et al., 2015). Living with HIV/AIDS greatly affects the psychological well-being of bearers to such an extent that PLHA are more at risk of developing mental disorders than the general population (Camara et al., 2020; Charles et al., 2012; Chaudhury et al., 2016; Duko et al., 2019).

Studies looking at psychological distress among PLHA have reported elevation of psychological distress and its association with some psychosocial variables (Herek et al., 2013; Liu et al., 2013; Parcesepe et al., 2018; Tesfaye & Bune, 2014). For example, studies have shown a negative association between experiencing HIV-related stigma (either anticipatory, internalized, and enacted), low social support (Herek et al., 2013; Liu et al., 2013; Tesfaye & Bune, 2014), negative life events, non-disclosure of HIV status (Tesfaye & Bune, 2014), sexual risk behaviors and adherence to treatment (Tlhajoane et al., 2018) with psychological distress. HIV-related stigma (particularly internalized stigma) has been reported to be associated with psychological distress, more importantly depression (Basha et al., 2019; Bimal Charles et al., 2012; Parcesepe et al., 2018; Simbayi et al., 2007; Stevelink et al., 2011). Stigma undermines individual's identity and ability to cope with the disease, with detrimental effect on variety of health-related outcomes (Hoffman et al., 2017; Rueda et al., 2016). The fear of discrimination on the other hand may limit the likelihood of disclosure to potential sources of social support (Skinner & Mfecane, 2004). Likewise, alterations in physical appearance, particularly those with increased concerns in appearance may drive internalized stigma, psychological distress as well as poor quality of life (Blashill et al., 2012; Herrmann et al., 2013; Igwe et al., 2016).

The role of social support in modifying psychological distress among PLHA has been documented in the literature (Cummings et al., 2014; Matsumoto et al., 2017; Reich et al., 2010). According to Cohen and Wills (1985) social support can take two forms: structural support or functional support. Structural social support refers to the social network while functional social support represents specific functions provided by members in the social network, such as emotional, informational, and companionship support. This appears to be significant to the wellbeing of PLHA than the structural social support (Serovich et al., 2001), and in reducing psychological distress such as depressive or anxiety symptoms among PLHA (Liu et al., 2013). Among PLHA, those with high social support are less likely to suffer depression, stress, and anxiety but more likely to have better overall health (Asante, 2012; Kingori et al., 2015). However, experiencing eternalized stigma may diminish this buffering effect of social support on psychological distress (Parcesepe et al., 2018). Although intervention at improving social support may not be sufficient at reducing psychological distress among PLHA (Parcesepe et al., 2018), effort at enhancing social support may go a long way at improving the overall health of PLHA. Improved mental wellbeing and social support have been reported to mitigate adverse consequences of HIV (Asante, 2012; Igwe et al., 2016; Parcesepe et al., 2018; Tesfaye & Bune, 2014) including HIV-risk behavior (Fang et al., 2019). However, there are limited studies in this environment looking at the impact of social support on psychological distress among PLHA. Most study from this environment had either reported the burden psychological distress along with some socio-demographics such as gender, level of education, disclosure, stressful life events or in association with either stigma or social support. This study builds on these by examining the relationship between psychological distress, socio-demographic and clinical variables as well as various sub-units of social support.

Recent improvement in the care of PLHA continues to change the face of HIV infection from a 'deadly disease' to a chronic illness with attendance psychological sequelae. Like in other chronic diseases (Ayana et al., 2019; Conversano, 2019; Martino et al., 2019; Merlo, 2019), psychological factors influence the course and treatment outcomes of HIV/AIDS, including the quality of life and subjective wellbeing of the patient. It may affect disease adaptation, adherence to medication, empowerment, self-management and psychic integration of disease, and independent of potential confounders can predict and impact mortality negatively (Martino et al., 2019; Merlo, 2019; Settineri et al., 2019). This calls for the need to understand factors associated with such psychological sequelae among PLHA and other chronic diseases in order to reduce impact of such.

### 1.1 Study objectives and Hypotheses

The objectives of this study were to examine the rate of PD, and its association with socio-demographics, pre- and post-counseling and the perceived social support among PLHA.

The following hypotheses were raised for this study: Sociodemographic characteristics are associated with increased of the risk of PD among PLHA. The risk of PD is increased by absence of either pre- or post-counseling and the duration of illness. As the network of social support increases, the risk of PD decreases.

## 2. Materials and Methods

### 2.1 Study design and setting

Data were collected through a cross-sectional survey at an out-patient HIV/AIDS treatment and counselling clinic of the Ekiti State University Teaching Hospital, Ado-Ekiti, located in Southwestern Nigeria. The hospital provides primary and tertiary of health-care to over three million people in her catchment area, including PLHA.

### 2.2 Study population and sample size determination

The study population consists of the entire adult population of PLHA attending the ART and counseling clinic. Usually, patients in this out-patient clinic get between 2 to 8 weeks' follow-up appointments. The frequencies of the appointments given at the clinic depend on the level of physical health; the presence or absence of other physical co-morbidity, or the need for close laboratory evaluation. At the onset of the study, there are about 890 patients on regular visits to the clinic.

The sample size was determined using an online sample size calculator, assuming standard normal distribution, 5% margin of error or the tolerable margin of error or level of precision (d=0.05), a Z score of 1.96, and the anticipated proportion of patients experiencing psychological distress based on previous study (Parcesepe et al., 2018). Assuming a 10% attrition rate, a total of 324 participants were enrolled for the study. The participants were selected through a simple random sampling of the study population on each clinic day. The study was conducted over a period of three months based on the longest follow-up appointment given to the patients.

#### 2.2.1 Exclusion and inclusion criteria

The inclusion criteria were a seropositive diagnosis of HIV/AIDS and age ranging from 18 to 70 years. Those with debilitating physical illness, cognitive impairment, those who were pregnant, or diagnosed less than six months were excluded from the study.

### 2.3 Measures

A socio-demographic questionnaire was developed by the researchers incorporating demographic information such as gender, age, marital status, educational status, employment, duration of diagnosis of HIV infection, and the duration on HAART. We examined the presence of psychological distress with the 10-item Kessler Psychological distress scale (K-10), and the perceived social support with the Multidimensional Scale of Perceived Social Support (MSPSS).

The Kessler Psychological Distress Scale (K-10) is a simple measure of psychological distress (Kessler et al., 2003). It consists of 10 questions about ones' emotional states. Each item is scored from 1- 'none of the time' to 5- 'all of the time'. Scores of the 10 items were then summed together to yield a minimum score of 10 and a maximum score of 50. The higher the scores, the higher the levels of psychological distress of the individual. A K10-Score of 10-19 represents the likelihood to be well while 20–24, 25–29, and 30-50 represent mild, moderate, and severe psychological distress respectively. Participants' scores were dichotomized into two, those with K-10 score of 10-19 (no psychological distress) and those scoring 20 and above (those with psychological distress). It has a good predictive power (Sampasa-Kanyinga et al., 2018) and a sensitivity of 53%; specificity of 97% at a score of 17 or greater for estimation of clinically significant PD (Anderson et al., 2013)

The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item self-report inventory. It measures perceived social support from family, friends, and significant others (Zimet et al., 1988). Respondents use a 7-point Likert scale (from very strongly disagree to very strongly agree with each item). An earlier psychometric study employing different subject samples suggested that it has a strong factorial validity (Canty-Mitchell & Zimet, 2000). The construct validity of 'the significant others' and family subscales was demonstrated. Each of these forms a separate sub-scale relating to perceived social support from significant others, from friends and family members. A total score was calculated by adding all the scores from each item and then divided by 12. The subscale scores were calculated by finding the mean of various items that form a subscale. For example, Significant Other (SO) Subscale was generated by addition of score of items 1, 2, 5, & 10, Friends Subscale (FRI) by adding together items 6, 7, 9, & 12 and Family Subscale (FAM) by adding together items 3, 4, 8, & 11, and then the sum of each sub-scale was divided by 4. A mean total scale score ranging from 1 to 2.9 was considered as low support, a score of 3 to 5 was considered as moderate support while a mean score from 5.1 to 7 was considered as high support. The MSPSS has a Cronbach alpha of 0.94 for the total scale, 0.95 for the FAM subscale, 0.94 for the FRI subscale and 0.91 for the SO subscale (Eker & Arkar, 1995). The reliability and criterion validity were adjudged satisfactory among Nigerian adolescents (Aloba et al., 2019).

### 2.4 Ethical Consideration

Written informed consent was obtained from each participant and each also signed the consent form. Permission and ethical clearance were also obtained from the Research and Ethics Review Committee of the Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. Confidentiality of information obtained was ensured throughout the process and the study was conducted according to Helsinki Declaration and its later amendments.

### 2.5 Statistical Analysis

Descriptive statistics (including frequency tables and bar chart for categorical data, and mean with standard deviation for numerical data) were performed to determine the distribution of all the variables studied, including the participants' level of psychological distress as assessed by Kessler psychological distress scale (K-10) and levels of social support as assessed by MSPSS. The total means and standard deviation for the K-10 and MSPSS scores were calculated. Bivariate and multivariate analyses were used to describe relationships between respondents' characteristics and the presence of psychological distress. Factors with a p-value of 0.10 or less during bivariate analysis were entered into multiple logistic regression to determine their strength of association with psychological distress. Group means differences in continuous variables were examined using t-tests. Correlation analysis was used to examine the relationship between continuous variables (K-10 scores, MSPSS score, duration of illness, and duration on HAART). The level of significance was set at $p \leq 0.05$.

## 3. Results

### 3.1. General measures

Out of a total of 324 participants that were recruited for the study, 26.5% reported significant psychological distress as measured by K-10. The mean K-10 scores was 17.02 ±6.70. The severity of psychological distress ranges from mild (13.0%), moderate (6.9%) to severe (5.9%).

### 3.2 Socio-demographics

Participants were majorly females (74.4%), married (71.0%), employed (86.9%), and under the age of 40 years (54.6%). Their ages ranged from 18 to 70years with a mean of 39.33 ± 9.98. Men were significantly older (mean age 41.96yrs) than women (mean age of 38.43yrs), (t= 2.814, p=0.005). The mean duration of diagnosis was 4.21 ±3.36 with a range of 1-17years. Quite an appreciable number of participants who were married were aware of their spouse's HIV status. Other sociodemographic characteristics are as shown in table 1.

**Table 1.** Sociodemographic variables

| Variables | Frequencies (%) |
|---|---|
| Age group | |
| 18-29 | 52 (16.0) |
| 30-39 | 125 (38.6) |
| ≥ 40 | 147 (45.4) |
| Gender | |
| Male | 83 (25.6) |
| Female | 241 (74.4) |
| Level of Education | |
| None | 13 (4.0) |
| Primary | 46 (14. 2) |
| Secondar | 115 (35.5) |
| Tertiary | 150 (46.3) |
| Marital Status | |
| Singles | 41 (12.7) |
| Married | 230 (71.0) |
| Separated/divorced | 20 (6.1) |
| Widow | 33 (10.2) |
| Employment status | |
| Employed | 275 (84.9) |
| Unemployed | 38 (11.7) |
| Student | 11 (3.4) |
| Duration of diagnosis | |
| ≤ 1year | 80 (24.7) |
| >1 year | 244 (75.3) |
| Pre-counselling | |
| Yes | 280 (86.4) |
| No | 44 (13.6) |
| Post-counselling | |
| Yes | 313 (96.6) |
| No | 11 (3.4) |
| Informed others of status | |
| Yes | 284 (87.7) |
| No | 40 (12.3) |
| Aware of spouse' status | |
| Yes | 208 (73.2) |
| No | 76 (26.8) |
| Spouse status | |
| Negative | 118 (56.7) |
| Positive | 90 (43.3) |

### 3.3 Relationship between participants' sociodemographic variables and psychological distress

Table 2 shows the relationship between participants' sociodemographic variables and psychological distress. Participants who were without spouse [OR=1.68 (95%CI: 0.68-2.86)], had no post-counselling [OR=5.47 (95% CI: 1.56- 11.15), AOR =4.27 (95% CI: 0.77-13.69)], not aware of their spouse status [COR=1.20 (1.12-3.57), AOR=1.41 (0.68-2.90)] or did not disclose status to others [OR=2.23 (95%CI: 1.33-4.37), AOR=2.55 (0.84-7.74)] had a higher risk of developing psychological distress than their counterparts. Likewise, those with higher education [OR=0.70 (95%CI: 0.42-1.16)], duration of diagnosis more than a year

[OR=0.81(95%CI: 0.46-1.42)], or had no complication [OR=0.31 (95%CI: 0.17-0.56), AOR=0.20 (0.09-0.45)] were less likely to develop psychological distress.

**Table 2.** Relationship between sociodemographic variables and psychological distress

| **Variables** | **Psychological distress** | | **COR (95% CI)** | **P-value** | **AOR** | **P-value** |
|---|---|---|---|---|---|---|
| | Absent n (%) | Present n (%) | | | | |
| *Age* | | | | | | |
| 40years | 108 (73.5) | 39 (26.5) | 1.09(0.66-1.80) | 0.798 | - | - |
| 18-39 years | 133 (75.1) | 44 (24.9) | 1ref | | | |
| *Gender* | | | | | | |
| Female | 176 (73.0) | 65 (27.0) | 1.33 (0.74-2.42) | 0.342 | - | - |
| Male | 65 (78.3) | 18 (21.7) | 1ref | | | |
| *Educational level* | | | | | | |
| Tertiary | 117 (78.0) | 33 (22.0) | 0.70 (0.42-1.16) | 0.216 | - | - |
| ≤Secondary | 124 (71.3) | 32 (28.7) | 1ref | | | |
| *Marital status* | | | | | | |
| Without spouse | 63 (67.0) | 31 (33.0) | 1.68 (0.68-2.86) | 0.052 | 1.15 (0.33-4.01) | 0.828 |
| With spouse | 178 (77.4) | 63 (22.6) | 1ref | | | |
| *Employment status* | | | | | | |
| Unemployed | 26 (68.4) | 12 (31.6) | 1.40 (0.67-2.91) | 0.449 | - | - |
| Employed | 215 (75.2) | 67 (24.8) | 1ref | | | |
| *Duration of diagnosis* | | | | | | |
| >1year | 184 (75.4) | 60 (24.6) | 0.81(0.46-1.42) | 0.464 | - | - |
| 1 year | 57 (71.3) | 23 (28.7) | 1ref | | | |
| *Pre-counselling* | | | | | | |
| No | 31 (70.5) | 13 (29.5) | 1.26 (0.62-2.54) | 0.521 | - | - |
| Yes | 210 (75.0) | 70 (25.0) | 1ref | | | |
| *Post-counselling* | | | | | | |
| No | 4 (36.4) | 7 (63.6) | 5.47 (1.56- 11.15) | **0.008** | 4.27 (0.77-13.69) | 0.097 |
| Yes | 237 (75.7) | 76 (24.3) | 1ref | | | |
| *Disclosure of status to others* | | | | | | |
| No | 25 (59.5) | 17 (40.5) | 2.23 (1.33-4.37) | **0.023** | 2.55 (0.84-7.74) | 0.099 |
| Yes | 216 (76.6) | 66 (23.4) | 1ref | | | |
| *On HAART* | | | | | | |
| No | 20 (71.4) | 8 (28.6) | 1.18 (0.50-2.79) | 0.821 | - | - |
| Yes | 221 (74.7) | 75 (25.3) | 1ref | | | |
| *Aware of spouse status* | | | | | | |
| No | 49 (66.2) | 25 (33.8) | 1.20 (1.12-3.57) | **0.019** | 1.41 (0.68-2.90) | 0.353 |
| Yes | 165 (78.9) | 43 (21.1) | 1ref. | | | |
| *Spouse status* | | | | | | |
| Positive | 70 (77.8) | 20 (22.2) | 1.18 (0.60-2.32) | 0.630 | - | - |
| Negative | 95 (80.5) | 23 (19.5) | 1ref | | | |
| *HIV complications* | | | | | | |
| No | 213 (78.6) | 58 (21.4) | 0.31 (0.17-0.56) | **0.001** | 0.20 (0.09-0.45) | **0.001** |
| Yes | 28 (52.8) | 25 (47.2) | 1ref | | | |

COR: Crude odd ratios; AOR: Adjusted odd ratio; CI: confident interval; Bold values were the significant values

### 3.4 Multidimensional Scale of Perceived Social Support of the participants

The mean total MSPSS score of the participants was 3.44 ± 1.36 while the mean scores of the subscales were 2.09 ±1.63, 3.02±2.01, and 5.15±1.75 for friends, family, and significant others respectively. The mean score of SO sub-scale was significantly higher than the friends (t=24.94, 95%CI: 2.83-3.12, **p=0.001)** or the family subscale (t= 16.99, 95% CI: 1.87-2.37, **p=0.001)**. As shown in Figure 1, except for significant others' sub-scale where the majority of the participants rated their perceived social support high, other sub-scales were rated low by the majority.

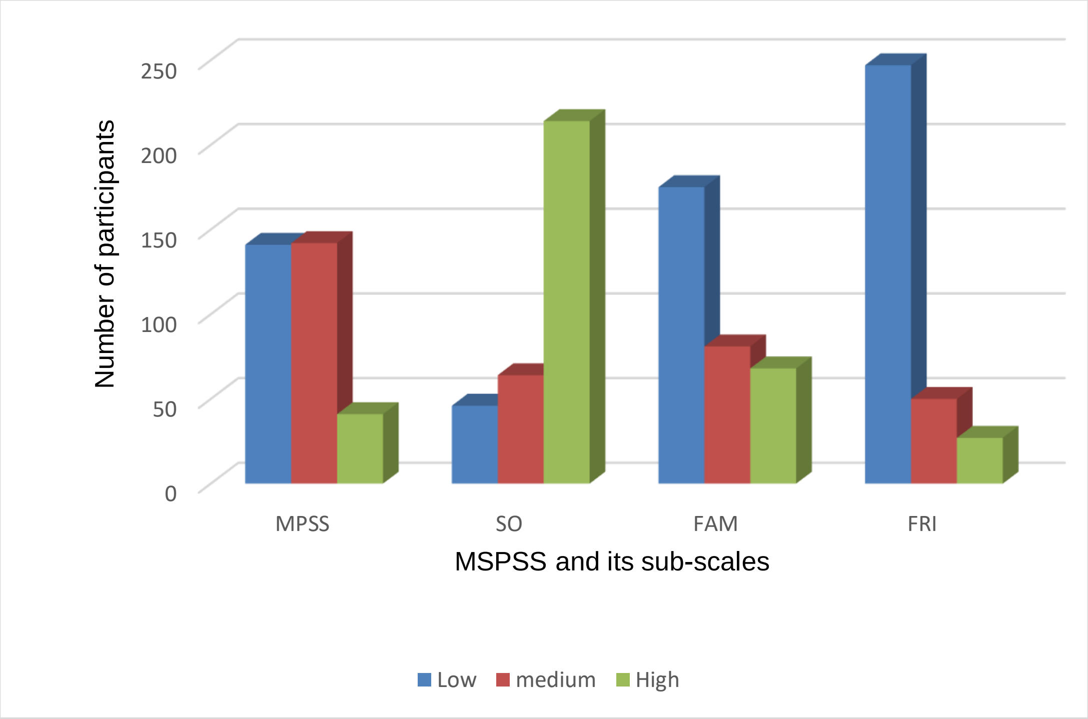

**Figure 1.** Bar chart showing participants' levels of MSPSS scores

MSPSS: Multi-dimensional Scale of Perceived Social Support; SO: Significant Others; FAM: Family subunit; FRI: Friend subunit

### 3.5 Correlations between MSPSS, duration on HAART, duration of illness and psychological distress

Table 3 shows the correlations between MSPSS and its sub-scale, duration on HAART, duration of illness MSPSS, duration on HAART, duration of illness and psychological distress. There was a negative correlation between psychological distress and MSPSS (r= -0.116, p=0.037), SO (r= -0.276, p=0.001), Family subscale (r= -0.007, p= 0.905), duration on HAART (r= -0.068, p=0.255) and duration of diagnosis (r= -0.078, p=0.159).

**Table 3.** Correlations between MSPSS, duration on HAART, duration of illness and psychological distress

| **Variables** | **Mean (SD)** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| K-10 | 17.02 (6.70) | 1 | | | | | | | |
| MSPSS | 3.44 (1.36) | -0.116* | 1 | | | | | | |
| SO | 5.15 (1.75) | - 0.276** | 0.471** | 1 | | | | | |
| Family | 3.03 (2.01) | -0.007 | 0.825** | 0.144 | 1 | | | | |
| Friends | 2.08 (1.63) | 0.021 | 0.684** | 0.002 | 0.567 | 1 | | | |
| Duration on HAART | 3.74 (2.73) | -0.149* | 0.016 | 0.039 | 0.040 | 0.016 | 1 | | |
| Duration of Diagnosis | 4.21 (3.36) | -0.139 | 0.010 | 0.089 | -0.012 | -0.030 | 0.904** | 1 | |
| Age | 39.33 (9.98) | -0.014 | -0.046 | -0.049 | -0.037 | -0.048 | 0.256** | 0.266** | 1 |

* Correlation is significant at the **0.05** level, ** Correlation is significant at the **0.01**, K-10: 10-Item Kessler Psychological scale; MSPSS: Multi-dimensional Scale of Perceived Social Support; HAART: Highly Active Antiretroviral Therapy; SO: Significant Others; SD: Standard Deviation.

## 4. Discussion

In this study, we examined factors associated with PD, and its relationship with perceived social support among PLHA at the HIV clinic and counseling center in a tertiary health facility in Nigeria. About a quarter (26.5%) of the participants were experiencing psychological distress, mostly, in mild to moderate levels. The prevalence reported in this study is comparable with previous studies among population of PLHA in South Africa, Nigeria, and Ethiopia (Deribew et al., 2013; Mthembu et al., 2017; Olagunju et al., 2012; Parcesepe et al., 2018), however, higher than what was reported in Zimbabwe, Ethiopia and Conakry (Camara et al., 2020; Duko et al., 2019; Tesfaye & Bune, 2014; Tlhajoane et al., 2018). Methodological differences and other study population characteristics may explain the differences in the rate of psychological distress reported in these studies.

Compared with the previous studies (Iliyasu et al., 2004; Obadeji et al., 2014), where only about one-third of the study population was 40 years and above, nearly half of our study population was 40 years and above similar to recent findings (Camara et al., 2020; Yi et al., 2015). This may be due to the improvement in the care of PLHA with attendant increase life expectancy, thus making HIV/AIDS a chronic disorder with attendant psychological sequelae rather than a ‘death sentence’ as previously perceived. Studies had repeatedly reported association between chronic disorders and psychological/psychiatric sequelae, and the impact of psychological morbidity on the on the quality of life of the bearer as well as the course and treatment outcomes (Ayana et al., 2019; Basha et al., 2019; Conversano, 2019; Martino et al., 2019; Merlo, 2019) including adaptation to disease, compliance and adherence to treatment (Settineri et al., 2019).

Like in other studies (Camara et al., 2020; Obadeji et al., 2014; Tesfaye & Bune, 2014; Yi et al., 2015), most of the participants were females. Although females constitute about 50% of PLHA globally, the "feminization" of the pandemic was more noticeable in Sub-Saharan Africa where over 60% of PLHA were women (Camara et al., 2020; NACA, 2016; Wang et al., 2016). This may be explained in terms of the ease of contracting the disease by females, an increase in gender-based violence and gender inequality in this region (Girum et al., 2018; Tesfaye & Bune, 2014; Wang et al., 2016). This is even more relevant in Nigeria where women and girls are abducted as a result of insurgency or other social vices like kidnapping (NACA, 2016). Such women are less likely to negotiate safe sex, thus increasing their risk of contracting sexually transmitted diseases such as HIV/AIDS (Shannon et al., 2012; Tsai & Subramanian, 2012). Despite the higher proportion of females, the rate of psychological distress was not significantly higher among women compared to men contrary to previous studies (Asante, 2012; Obadeji et al., 2014; Tesfaye & Bune, 2014). The improved provision of emotional support for this population of PLHA may explain this observation. Previous studies have reported a significantly higher rate of psychological distress, depression, or anxiety disorders among females compared with their male counterparts.

Conversely, there was no significant association between sociodemographic variables such as age, levels of education, employment status, marital status, and psychological distress as reported in previous studies (Basha et al., 2019a; Gupta et al., 2010; Obadeji et al., 2014). However, the females, unemployed, those who had no spouse, no post-counseling, or had not disclosed their status to others had increased risk of developing psychological distress. Previous studies have reported inconsistent findings, with some reporting significant association between psychological distress, depression/anxiety and marital status on one hand (Judd et al., 2000; Obadeji et al., 2014) and being female and levels of education on the other hand (Basha et al., 2019a; Gupta et al., 2010). However, others had reported no significant association between sociodemographic variables and psychological distress similar to our findings (Kinyanda et al., 2011). Nevertheless, the absence of HIV-related complications (such as tuberculosis, significant alteration in physical appearance) was a major protective factor. The presence of co-occurring conditions had been reported to increase risk of mental health challenges in people living with HIV/AIDS (Ayana et al., 2019; Remien et al., 2019).

In recent times, counseling has become a core element in providing holistic health care for people living with HIV/AIDS. Finding from this study shows that participants who did not have post-test counseling were more likely to develop PD than those who had such. Like other life-threatening chronic illnesses, emotional reactions to an HIV positive test are part of the normal and expected range of responses, with some requiring minimal intervention, or developing some levels of maladjustment (Chippindale & French, 2001). This may explain the significant association between the absence of post-test counseling and the risk of developing PD in this population of PLHA. Providing counseling before or after testing is essential in preparing PLHA to cope effectively during and immediately after testing, and with problems that may appear over time (Meursing & Sibindi, 2000). Again, those who did not disclose their HIV status to an important person in their life (such as family members and spouse) significantly had a higher level of PD compared with those who did. Several studies had shown a significant relationship between non-disclosure of status and PD such as depression and anxiety disorders (Dessalegn et al., 2019; Obadeji et al., 2014; Tesfaye & Bune, 2014). Disclosing one's status to others may provide a platform to ensure support from others which may help in ameliorating psychological distress. Similarly, those who did not disclose their status to their spouse reported a higher level of psychological distress compared with those who did. None disclosure of status to one's spouse may come with some levels of guilt and anxiety. Disclosure enhances a good relationship with ones' partner (Dessalegn et al., 2019). Nevertheless, the knowledge of one's spouse status, whether negative or positive did not significantly increase the risk of psychological distress.

Participants in this study reported varying levels of social support; with the majority reporting mild to moderate support similar to earlier findings (Okonkwo et al., 2016). The SO of the MSPSS was significantly scored higher than other sub-scales (Family and Friends). This shows that PLHA were more satisfied with support from significant others than with either family or friends. This may be due to failure of disclosure of status to such people or as a result of self-stigma which keep such individual away from friends or family members.

In this study, a negative correlation was observed between psychological distress and perceived social support. This shows that as perceived social support increases, the possibility of developing psychological distress decreases. In other words, poor social support is associated with increases the risk of psychological distress. This substantiates findings from previous studies (Lam et al., 2007; Reich et al., 2010; Tesfaye & Bune, 2014). The relationship was not equally displayed by various subscales of MSPSS. There was a positive correlation between the friend subscale, suggesting that friends may not be a significant factor in ameliorating psychological distress, possibly due to non-disclosure to such.

Although, several processes shape psychological outcomes in HIV disease, efforts at improving social-support increase the sense that one matters to others, and such interventions assist patients to move from avoidant to active coping strategies (Schmitz & Crystal, 2000). However, accessing this resource by PLHA requires disclosure of one's status.

This study possesses a few limitations. One such limitation is the cross-sectional design of the study. Establishing direct causality between independent variables and PD may be a challenge. Some psychosocial challenges just around the time of the interview may influence the way some of the participants respond to the variables in the questionnaires. Nonetheless, the study is one of the few studies in Nigeria examining the relationship between socio-demographics, social support and PD among PLHA and several other authors had used similar methodology in exploring association between some of these factors and PD. Again, some variables with few numbers may serve as confounders, however, the effect of this was limited by adjusting for confounders.

### 4.1 Clinical Implications

Findings from this study underscore the need to incorporate psychological support into the care of PLHA from the point of diagnosis and during the course of treatment, more importantly in a developing economy like ours. Special attention needs to be given to the newly diagnosed as well as those with complications stemming from HIV infection. Provision of psychological support and care may go a long way in improving the treatment outcomes of PLHA. The study emphasized the need to bridge the gap between the medical care and psychological care, with the aim of improving patients' outcomes (Moskowitz et al., 2017).

## 5. Conclusions

The findings from this study show that quite a substantial number of PLHA still experience psychological distress despite improvement in care. Experiencing psychological distress, on the other hand, was associated with non-disclosure of status, more importantly to one's spouse, not receiving post-test counseling, the duration of diagnosis, and the presence of complications from HIV/AIDS. Additionally, study findings emphasize the importance of enhancing social support network for people living with HIV/AIDS in a bid to reduce psychological distress. Although, several processes influence the psychological wellbeing of PLHA, an effort at improving social support may increase the sense that one matters to others, and improves their adaptive responses.

## Competing interests

The authors declare that they have no competing interests.

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