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# A cross-sectional study on the biopsychosocial factors influencing quality of life and adherence to treatment of people living with HIV (PLHIV) in the National Capital Region

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## Abstract

**Introduction** This study investigated the association of selected biopsychosocial factors (i.e., CD4 cell count, self-stigma, and social stigma) with the quality of life and adherence to treatment of people living with HIV in the National Capital Region.

**Methods** A cross-sectional study design was conducted to document the health status and behavior of respondents affiliated with a clinic in Quezon City. Participants answered an online questionnaire containing the Berger HIV Stigma Scale, WHO-QOL for HIV, and HIV Treatment Adherence Self-Efficacy Scale. Bivariate analyses and prevalence risk ratios were used to determine the association of selected biopsychosocial factors with quality of life and adherence to treatment.

**Results** One hundred respondents were analyzed, of which 42% had CD4 cell counts < 350 cells/mm<sup>3</sup>, 43% had high self-stigma and 36% had high social stigma while 11% had poor QOL and 7% had poor ATT. There was no significant association of CD4 cell count, self-stigma and social stigma with quality of life and with adherence to treatment.

**Conclusion** A weak association was noted between poor QOL and low CD4 cell counts and among those who felt higher social stigma, but the relationships were not significant. The association between poor ATT and the selected biopsychosocial factors was not significant.

**Key words:** CD4 cell count, self-stigma, social stigma, quality of life, adherence to treatment

**I**n March 2016, the Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome

(HIV/AIDS) and the Anti-Retroviral Therapy (ART) Registry of the Philippines (HARP) reported 736 new HIV antibody seropositive individuals, which was 10% higher compared to the 667 antibody seropositive individuals in 2015. From January 1984 to March 2016, there have been 32,647 HIV antibody seropositive cases reported to HARP. Majority (43%) of these were recorded in the National Capital Region (NCR), with 14,102 cases being documented. The number of people newly diagnosed with HIV per day has drastically increased from one new case per day in 2008 to 29 new cases per day in 2016.<sup>1</sup>

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According to the World Health Organization (WHO), the Philippines continues to have one of the fastest growing HIV epidemics in the world, even though it was still considered to be of low prevalence. This alarming increase in the number of HIV cases has been attributed to several factors, such as having the lowest documented rates of condom use in Asia, increasing casual sexual activity, returning overseas Filipino workers from high-prevalence settings, widespread misconceptions about HIV/AIDS, and high needle sharing rates among injecting drug users.<sup>2</sup> Furthermore, different biopsychosocial factors had also been important considerations in the growing HIV epidemic. For instance, people living with HIV (PLHIV) experienced physical derailments and malfunctions brought about by the disease, had heavy emotional burdens, and feared isolation.<sup>3</sup> Since studies exploring the association of various biopsychosocial factors to the quality of life (QOL) and adherence to treatment (ATT) of PLHIV in the Philippines had been generally lacking, there was interest in identifying biopsychosocial factors that might possibly influence QOL and ATT. Any new information on determinants of HIV/AIDS might be valuable for health awareness advocacy campaigns, as well in improving current health programs for the prevention and control of this communicable disease.

This study determined the association of selected biopsychosocial factors - CD4 cell count, perceived self-stigma, and social stigma - to the QOL and ATT of people living with HIV in NCR.

## Methods

A cross-sectional study was conducted among people living with HIV (PLHIV) from a clinic in Quezon City using an online questionnaire which generated the respondents' biopsychosocial characteristics, measured stigma, quality of life and adherence to treatment. Three independent variables were analyzed, specifically CD4 level as the main biological factor, perceived self-stigma as the primary psychological factor, and social stigma as the sole social factor. In addition, the main dependent variables were QOL and ATT. The study was approved by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee.

Those recruited were adult PLHIV currently on anti-retroviral therapy (ART) with recent CD4 level

determination and who were willing to answer an online questionnaire in Filipino. Excluded were those who exhibited neuropsychiatric clinical manifestations (e.g., schizophrenia, psychosis, etc.), those who were AIDS converted, and did not know how to use the internet/computer. A sample size of 100 respondents was computed using the formula for proportion of a single population, and were recruited via non-probability sampling (e.g., snowball method) from Klinika Bernardo, a social hygiene clinic and HIV treatment hub in Quezon City.

The online questionnaire had three parts, the first of which documented the demographics and biopsychosocial characteristics of the study subjects. The second part, which contained inquiries generated from the Berger HIV Stigma Scale, measured both self-stigma and social stigma.<sup>4</sup> It consisted of 24 items that measured self-stigma, including its two aspects personalized and negative self-stigma, and 16 items that measured social stigma, including its two aspects disclosure concerns and public attitudes. It was answered using a 4-point Likert scale (1 - strongly disagree, 2 - disagree, 3 - agree, 4 - strongly agree). Scores of 61 to 96 were considered as high self-stigma and 24 to 60, as low self-stigma. Scores of 41 to 64 were considered as high external stigma and 16 to 40, as low external stigma.

The third part was patterned after the validated WHO-QOL for HIV and the HIV Treatment Adherence Self-Efficacy Scale (HIV-ASES).<sup>5,6</sup> The QOL part consisted of 31 items that measured the six domains (physical health, psychological, level of independence, social relationships, environment and spirituality), answered using a 5-point Likert scale (1 - very dissatisfied, 5 - very satisfied). Scores of 13-20 were interpreted as good QOL and 4 to 12, as poor QOL. The HIV-ASES consisted of 12 items rated through a 10-point Likert scale. Scores of 67 to 120 were considered as having good ATT and 12 to 66, as having poor ATT. The Filipino version of the questionnaire was reviewed by a language professional. Pilot testing of the questionnaire was done, in cooperation with PLHIV from the non-government organization, Pinoy Plus Association, Inc. in Manila.<sup>7</sup>

After finalization of the main data collection tool, the questionnaire was uploaded on Online Forms by Google. All study subjects who met the inclusion criteria were asked to sign the informed consent form, before answering the online self-administered

questionnaire. All study subjects accessed the online questionnaire within the Klinika Bernardo facility, using a single computer. Each respondent took about 30 minutes to complete the online questionnaire.

Data gathered were encoded digitally and tabulated using the Statistical Package for the Social Sciences (SPSS Version 24). Frequency distribution, percentages, and means were used to present descriptive statistics, such as age and sex. Furthermore, Chi-square test, Fisher's exact test, and prevalence risk ratio were used to analyze the association between variables.

## Results

A total of 106 respondents agreed to participate in the study. However, six were excluded since two of them had already converted to AIDS, while the remaining four did not know their current CD4 cell count. Thus, only 100 respondents were included in the study and analyzed. Majority (97%) of respondents were genotypic males, reflecting the vulnerable population for HIV in the Philippines, specifically the men who have sex with men (MSM). The age range was 15-50 years (31.2 years  $\pm$  6.66 years), but majority of the study subjects (57%) were aged 26-35 years. Most of the subjects were single (94%) and high school graduates (77%).

Important to note was almost all subjects (97%) had affiliation with HIV/AIDS support groups, such as Partnership for Prescription Assistance, The Project Red Ribbon, AIDS Society of the Philippines, White Dove Community Care Inc., Pinoy Plus Association

Inc., HIV/AIDS Support House Inc. (HASH), and Take the Test. In addition, 99% of the respondents were diagnosed to have HIV within the last five years, while only 1% was diagnosed to have HIV more than five years ago. The mean CD4 cell count was 448.8 cells/mm<sup>3</sup> (SD=222.76); majority (87%) of the study subjects remained asymptomatic and with good functional capacity, with most (81%) being aware of how they acquired the HIV infection.

Forty-two percent of respondents had CD4 cell counts < 350 cells/mm<sup>3</sup>, 43% had high self-stigma and 36% had high social stigma while 11% had poor QOL and 7% had poor ATT as seen in Table 1. There was no significant association of CD4 cell count, self-stigma and social stigma with quality of life and with adherence to treatment (Table 1).

## Discussion

### CD4 cell count as a biological factor

Monitoring the disease status of PLHIV through immunological markers, such as CD4 cell count, has been a cornerstone for managing patients prior to and during ART. CD4 cell count has been used as a guide for assessing risk for opportunistic illnesses, for determining the timing of ART initiation, and for evaluating possible treatment failure.<sup>8</sup> Moreover, CD4 cell count has been strongly associated with HIV progression to AIDS-related illnesses or deaths. However, rapid progression to AIDS could be prevented through ART, coupled with early

**Table 1.** Bivariate analysis of selected biopsychosocial factors and QOL and ATT among PLHIV.

|                                    | Quality of Life |      | p-value*         | Adherence to Treatment |      | p-value*         |
|------------------------------------|-----------------|------|------------------|------------------------|------|------------------|
|                                    | Poor            | Good |                  | Poor                   | Good |                  |
| Biological factor: CD4 cell count  |                 |      |                  |                        |      |                  |
| • < 350 cells/mm <sup>3</sup>      | 5               | 37   | 1.15 (0.38-3.52) | 1                      | 41   | 0.23 (0.03-1.84) |
| • $\geq$ 350 cells/mm <sup>3</sup> | 6               | 52   |                  | 6                      | 52   |                  |
| Psychological factor: Self-stigma  |                 |      |                  |                        |      |                  |
| • High Level                       | 4               | 39   | 0.76 (0.24-2.42) | 1                      | 42   | 0.33 (0.04-2.86) |
| • Low Level                        | 7               | 50   |                  | 4                      | 53   | 0.39             |
| Social factor: Social stigma       |                 |      |                  |                        |      |                  |
| • High Level                       | 5               | 31   | 1.48 (0.49-4.52) | 1                      | 35   | 0.44 (0.05-3.83) |
| • Low Level                        | 6               | 58   |                  | 4                      | 60   | 0.65             |

\* Fisher exact test

diagnosis; thus, in the advent of better and faster diagnosis with prompt initiation of effective medications, PLHIV would now have a longer life expectancy.<sup>9</sup>

However, previous researches found inconsistent association between CD4 cell count and QOL. One study showed that patients with higher CD4 cell counts had better QOL, while patients with lower CD4 cell counts had poorer QOL. PLHIV with higher CD4 cell counts usually had better nutrition, higher educational attainment, higher socioeconomic status, better employment opportunities, and an effective health care support system; thus, their QOL was deemed better, as compared to PLHIV with low CD4 cell count.<sup>10</sup> However, another study found the relationship between CD4 cell count and QOL not to be statistically significant, and female PLHIV were documented to have poorer QOL compared to male PLHIV.<sup>9</sup>

Bivariate analysis of this study also found weak association between low CD4 cell count and poor QOL, but this relationship was not statistically significant (PRR=1.15, 95% CI 0.38, 3.52). Important to note was that majority of subjects, regardless of CD4 cell count, still reported good QOL. This observation could be explained possibly by the self-report of majority of the subjects (87%) of having no subjective complaints and good functional capacity. Since there were no significant limitations in the ability of the subjects to perform their regular activities of daily living, regardless of their current levels of CD4 cells, good QOL was still the common perception. This finding suggested that CD4 cell count was not a significant determinant for poor QOL, and the drop of CD4 cells below 350 cells/mm<sup>3</sup> did not automatically translate to apparent perception of poor QOL.

QOL could be viewed as a subjective construct and thus, several factors aside from immunological markers could consequently influence it.<sup>10</sup> Some factors believed to affect QOL would be age, socioeconomic status, behavioral characteristics, psychiatric conditions to include depressive and anxiety symptoms, annual income, socialities and relationships, and educational attainment.<sup>9,11</sup> Another possible determinant of QOL was gender. Given that majority of the subjects were males and only three were females, this unequal distribution in terms of gender could also be a potential source of interference in the data gathered.

ART had been the mainstay of management of HIV/AIDS, especially in reducing overall mortality. Readily available antiviral agents had been recommended to achieve life-long viral suppression, though cure and complete restoration of health had never been the main objective of ART.<sup>12</sup> Consequently, good compliance to ART had been previously linked to good QOL, together with lower HIV viral load, absence of debilitating symptoms, greater CD4 cell count, and higher levels of hemoglobin.<sup>13</sup> Thus, looking into compliance to ART could also be an important parameter to consider in the holistic management of PLHIV.

Patients with high CD4 cell counts ( $\geq 660$  cells/mm<sup>3</sup>) demonstrated suboptimal ATT, as compared to PLHIV with intermediate (450-660 cells/mm<sup>3</sup>) and low ( $\leq 450$  cells/mm<sup>3</sup>) CD4 cell counts.<sup>14</sup> Such an observation could be reflected in this study since low CD4 cells counts and poor ATT had a PRR of 0.23 (95% CI 0.03, 1.84). However, this finding was not consistent with other investigations, which concluded that PLHIV with CD4 cell counts of 200-400 cells/mm<sup>3</sup> exhibited the most favorable ATT.<sup>15</sup>

Findings of this study revealed that PLHIV generally exhibited good ATT, regardless of their CD4 cell counts, an observation consistent with other previous investigations.<sup>13,14</sup> Reasons for such inconsistencies in the behavior of PLHIV when it comes to ATT could still be explored. A high level of CD4 cell count could reflect positive response to ART, which consequently might result in either good ATT or poor ATT.

### Self-stigma as a psychological factor

The growing epidemic and pathogenicity of HIV/AIDS had become a major public health concern not only in the Philippines, but also from the global perspective. The impact of the condition on the patient resulted in the need for a holistic type of management that addressed the emotional and psychological issues of fear, ignorance, denial, anger with PLHIV. Perceived self-stigma, therefore, was conceptualized because of internalization of guilt, blame, hopelessness, shame, and fear for discrimination among PLHIV.<sup>16</sup>

Many investigators have studied potential barriers to achieving good QOL and having good ATT among PLHIV.<sup>17-20</sup> In sub-Saharan Africa, PLHIV compromised health-related QOL due to effects of

clinical depression and negative self-esteem brought about by self-stigma. The depression had been further aggravated by anxiety symptoms and feelings of alienation among PLHIV. Thus, some experts concluded that there was an urgent and apparent need to confront self-stigma, as this might undermine ATT in HIV/AIDS prevention and treatment.<sup>20</sup>

This study revealed that perceived high self-stigma was not associated with poor QOL (PRR=0.76, 95% CI 0.24, 2.42), as well as with poor ATT (PRR=0.33, 95% CI 0.04, 2.86). The lack of association could be explained by the difference in how each PLHIV viewed self-stigma. For instance, HIV-related stigma could manifest differently and in varying degrees among PLHIV.<sup>21</sup> A meta-analysis of 4,104 PLHIV demonstrated a negative correlation between self-stigma and disclosure of HIV status to others.<sup>22</sup> Past experiences of rejection due to one's HIV status, as well as subjective beliefs regarding how negatively PLHIV were regarded by others, had significantly impacted on the desire of PLHIV to disclose their HIV status to others.<sup>23</sup> Thus, some PLHIV could have endured difficulties in sustaining regular social interaction and relationships with peers, which eventually could result in poor QOL.<sup>17</sup>

Interesting to note also was that majority of the subjects had low perceived self-stigma level. This positive outlook of the subjects could be observed, and a possible explanation behind this was the presence of effective support groups, in the form of special HIV/AIDS non-government organizations, among the respondent PLHIV. Negative experiences brought about by being HIV positive could contribute to the perceived self-stigma. However, over time, better acceptance of one's HIV status had been attained perhaps through regular counseling sessions among support group members. In addition, educational attainment could be reflective of how PLHIV understood their medical condition, thereby enabling them to be empowered to seek a more active role in holistically managing their HIV status.

Perceived self-stigma has been documented to vary across different social environments.<sup>24</sup> For some, self-stigma might be perceived as a mere phase or an obstacle that the respondent had to successfully deal with and eventually transcend. Social settings could also play a role in the development of self-stigma, as a more supportive social setting could prevent the negative emotions commonly associated with having HIV. In contrast, some studies also suggested the

influence of family members, specifically spouse and biological children, could be negative at times, especially when they become the source of pressure and psychosocial stressor. This undue stress from family members could subsequently yield poor self-stigma.<sup>24,25</sup> This, however, did not appear evident among the subjects since majority of them were single males.

Despite the lack of association, self-stigma might still have a strong implication for PLHIV in terms of treatment, care, and support. HIV-related self-stigma could potentially compromise QOL of PLHIV, reduce their willingness to disclose their status to significant others, and affect their access to healthcare and compliance to ART.<sup>21</sup>

### **Social stigma as a social factor**

Social stigma, an interpersonal experience of stigma, referred to discriminatory behaviors directed towards people with stigmatized conditions, specifically towards PLHIV.<sup>21</sup> HIV-related stigma could potentially impact the health and well-being of PLHIV negatively, with deleterious effects on their care, treatment, and quality of life.<sup>25</sup>

The QOL of PLHIV could be affected not only by one's general health, but by psychological well-being and social status. The psychosocial aspect of QOL had been increasingly important for PLHIV, as the QOL had been shown to deteriorate relative to the progression and chronicity of HIV infection.<sup>26</sup> This decline could be triggered not only by disease stage and physical condition, but could also be precipitated by social stigma among other factors.

This study determined that PLHIV with high degree of social stigma had weak association with poor QOL, but this relationship was not statistically significant (PRR=1.48, 95% CI 0.49, 4.52). This finding implied that PLHIV had good QOL, regardless of the level of social stigma experienced.

Apparently, the level of social stigma that the respondent PLHIV received did not necessarily affect their QOL. Such an observation could be explained by the fact that majority of the study participants had CD4 cell counts  $\geq 350$  cells/mm<sup>3</sup> (58%) and were asymptomatic (87%), enabling these PLHIV to continue to have a good QOL. This observation is consistent with findings of other studies which

found that PLHIV who exhibited clinical symptoms had poorer QOL, compared to asymptomatic patients.<sup>27</sup> Moreover, as CD4 cell count improved, PLHIV manifested better health outcomes, became clinically stable, and subsequently felt good QOL.<sup>28</sup> Similarly, having effective social support group could be appreciated in this particular setting, wherein 97% of subjects were affiliated with one or more HIV/AIDS organizations in the Philippines. Since the development of stigma involved social interactions, it followed that social support could affect HIV-related stigma.<sup>29</sup> A supportive environment that accepted a person with HIV infection and provided positive experiences could help build a person's self-esteem and self-efficacy, while reducing psychological distress, including potential depression. Moreover, health and wellness, relationships and recreation, and faith-based aspirations were just some of the coping strategies the respondents could have possibly developed in dealing with stigma and discrimination.<sup>30</sup> Counseling programs, seminars and talks, health and wellness programs of various HIV organizations, like The Project Red Ribbon, Pinoy Plus Association Inc., HIV/AIDS Support House, Inc., played an important role in developing various coping strategies among PLHIV. In addition, the study participants were not challenged by any neuropsychiatric illnesses and so, were not deprived of opportunities to improve their QOL.<sup>31</sup>

Results of this study also showed that the respondent PLHIV had good ATT, regardless of the degree of social stigma experienced. The level of social stigma that PLHIV received appeared not to significantly affect their ATT. This finding was incongruent with other studies that concluded that PLHIV who experienced high levels of social stigma were more likely to report poor access to care and exhibited poor health-seeking behavior.<sup>32-34</sup>

The fact that most respondent PLHIV were part of HIV/AIDS organizations or support groups could have influenced the results of this study. Being a member of these social networks implied an optimistic outlook for most Filipino PLHIV, and this attitude could affirmatively influence their positive health seeking behavior and subsequent good compliance to ART. These support systems provided by HIV/AIDS organizations also helped PLHIV gain better access to HIV treatment, on top of the benefits derived from the regular psychosocial support extended by organization members to each

other. A highly perceived social support had been associated with less perceived HIV/AIDS stigma. Moreover, individuals who received social support were more capable of effectively dealing with life stressors, such as discrimination.<sup>35</sup>

A weak association was noted between poor QOL and lower CD4 cell counts (PRR=1.15, 95% CI 0.38, 3.52) and among those who felt higher social stigma (PRR=1.48, 95% CI 0.49, 4.52), but the relationships were not deemed statistically significant. No association was noted between poor ATT and the selected biopsychosocial factors.

A weak association was noted between poor QOL and low CD4 cell counts and among those who felt higher social stigma, but the relationships were not significant. The association between poor ATT and the selected biopsychosocial factors was not significant.

The current study had limitations that need to be addressed in future research. First, data were gathered only from PLHIV who were affiliated with Klinika Bernardo. Accordingly, generalization of the findings of this study to other PLHIV should be done with caution. Moreover, recruiting PLHIV participants from different organizations and regions within the Philippines can ensure a better approximation of the Filipino PLHIV population. Second, this study focused on the associations of CD4 cell count, self-stigma, and social stigma to QOL and ATT, without considering other pertinent biopsychosocial factors, (i.e., presence of comorbid conditions and opportunistic infections, family dynamics and socio-economic profile of the subjects). In the future, a more exhaustive inquiry on other biopsychosocial factors should be probed on. Lastly, the current study utilized a cross-sectional design, making it difficult to formulate causal relationships among variables. Future research efforts could use a mixed method qualitative-quantitative longitudinal design.

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