# The Associations between Mental Health Literacy and HIV-related Treatment Outcomes among HIV/AIDS Outpatients in Vietnam

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#### Abstract

Data about mental health literacy and its associations with HIV-related treatment outcomes are both sparsely reported and presented with disparate results. This study aimed to assess the mental health performance among HIV/AIDS outpatients and examine the correlations between Mental Health Literacy Scale (MHLS) with some pre-specified HIV-related treatment outcomes, including clinical status, HIV-RNA suppression, antiretroviral (ART) failure, and treatment adherence. We conducted a single-center, cross-sectional study between June and October 2020 in Ho Chi Minh City, Vietnam. Adult HIV-infected patients were enrolled in the study when they routinely attended an outpatient clinic to receive medical consultations and antiretroviral therapy. Bivariate logistic regressions were used to study the associations between MHLS and major HIV-related health outcomes. A total of 406 HIV-infected participants were enrolled during the study period. The median MHLS among HIV/AIDS patients was 99 (Interquartile range (IQR): 93-107). Roughly 93% of patients were clinically stable, with a median CD4 count of 603 cells/µl. Two-thirds of patients achieved HIV-RNA suppression (undetectable threshold < 20 copies/ml). A total of thirteen (3.2%) patients were undertaking protease-inhibitors-based second-line ART regimens. The ART compliance of participants was evaluated at 92.1%. The logistic bivariate analyses did not show any significant correlations between mental health literacy with both pre-specified HIV-related health outcomes and ART adherence. The mental health performance among the HIV/AIDS outpatients at the HIV community-based clinic was at the intermediate level. The mental health literacy of patients was not statistically associated with the pre-specified HIV treatment outcomes.

*Keywords:* Adherence, Antiretroviral therapy, HIV treatment outcomes, Mental health literacy, Vietnam.

## Introduction

Although HIV incidence has decreased significantly in the antiretroviral therapy (ART) era, the World Health Organization (WHO) reported that in 2020 there were 37.7 million people living with HIV/AIDS (PLWHA) worldwide, and approximately 680,000 people died of AIDS-related diseases and 1.5 million new HIV infections [1]. There has been an increase in the global ART coverage in recent

years, and the WHO has recommended dolutegravir as the prioritized HIV treatment in all populations [2-4]. In terms of mental health, the WHO reported that an estimated 8% of the global population experienced mental disorders [5]. Mental health disorders have become increasingly prevalent among PLWHA and have been shown to have a reciprocal impact on antiretroviral treatments and health outcomes of HIV-infected patients [6-8]. Several studies demonstrated that patient's health literacy was an important predictor of individual HIV/AIDS knowledge, which was further associated with and HIV-related health outcomes ART compliance [9, 10]. On this basis, we aimed to study the relationships between mental health literacy and HIV-associated treatment outcomes as well as treatment adherence. We presumed that higher mental health literacy would improve health outcomes of HIV-infected patients, including clinical status and HIV-RNA suppression. Importantly, to date. the associations between mental health literacy and HIV-related treatment outcomes and ART are not reported in Vietnam, along with disparate findings from previous study reports in other regions [11-18]. Therefore, our study aimed to provide more disease understanding in order to abridge the pre-existing knowledge gaps.

## **Materials and Methods**

## **Ethics Statement**

This study was approved by the Institutional Review Board of the Faculty of the Public Health, University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam. The approval number was 252, signed on 16 April 2020. All study participants completely understood the study objectives and gave their written informed consents. The study was performed in compliance with principles of the Good Clinical Practice and Helsinki Declaration.

## **Study Setting and Design**

We conducted a single-center, crosssectional, HIV-outpatient clinic-based study for four months between June and October 2020 at Mai Khoi charity clinic, Ho Chi Minh City, Vietnam. This clinic was selected as our study site, due to being well-represented as one of the largest HIV community-based clinics in Ho Chi Minh City, with approximately 1.200 HIV/AIDS patients from all urban areas in the city and nearby provinces from the central highland to southern regions in Vietnam. The clinic provided free-of-charge medical service and antiretroviral treatments to all registered HIV-infected outpatients. Patients routinely attending the clinic to receive medical consultations and ART were invited to enroll in the study.

## **Study Participants**

Eligibility criteria included being more than 18 years old, currently treated at the clinic and literate to thoroughly understand the survey forms. People who could not read or understand whole mental health questionnaires were excluded. Study participants were selected by using a simple random sampling method. A total of 406 participants were enrolled.

## **Study Procedures**

Patients would be provided verbal information statements about this study. For those who did not want to participate continued their routine medical care. The participants who agreed to participate in the study would sign the written consent forms. They were instructed to the quiet room to complete a self-reported mental health literacy questionnaire developed by O'Connor M. et al. in 2015 [19]. For any questions that participants did not understand, the study staff would explain them clearly on site. Finally, the completed questionnaires will be sealed in envelopes to ensure confidentiality. The study participants have conducted physical examinations and ART adherence evaluation. The clinical data were also extracted from medical records upon participants' approvals in the consent forms.

## **Study Definitions**

## WHO Clinical Staging of HIV/AIDS

The clinical staging of HIV/AIDS for adults with confirmed HIV infection was defined by WHO guidelines [20]. In brief, HIV/AIDS clinical stages are classified into four stages: stage 1, patients are asymptomatic; stage 2 (early HIV infection), patients have mild symptoms; stage 3 (progressive disease), patients manifest moderately symptoms and stage 4 (or AIDS), patients present severe opportunistic infections and/or life-threatening conditions.

#### WHO Virological Failure

Virological failure was defined as a persistently detectable plasma HIV viral load above 1,000 copies/ml, based on two consecutive measurements of HIV viral load after six months, accompanied with intensive counselling for ART adherence [20].

#### **ART Adherence Assessment**

The ART adherence was assessed in every clinic visit of patients, based on pill counts and on times of whether or not the patients missed monthly consultation and took ART on those missed days. Of patients who complied with the antiretroviral medications, more than 95% were evaluated as ART adherence. More specifically, 95% or more adherence was equivalent to missing less than two doses of the total 28 doses within 28 days. Patients also had to take ART medications within two hours before or after the fixed time by physician's instruction.

#### **Data Collection**

#### **Demographic and Psychosocial Variables**

These included age, sex, intravenous drug use, education, employment and marital status, and mental and financial support from family members.

#### **Clinical Variables**

These included WHO HIV clinical stages, recent six-month CD4 counts and HIV viral load measurements, antiretroviral adherence, and ART failure history.

#### Mental Health Literacy Scale Assessment

MHLS developed by O'Connor M. *et al.* in 2015 was selected to evaluate the mental health performance of all study participants on the basis that the MHLS was reported to have quite high internal and test-retest reliability with Cronbach's alpha ranging from roughly 0.8 to 0.87 [19, 21]. There were three stages in constructing the MHLS, including measure

development, pilot testing, and assessment of psychometrics and methodological quality. The MHLS questionnaire had 35 items covering the recognition of psychotic disorders, knowledge about risk factors and etiology, specialty support, self-treatment, information seeking, and positive and negative attitudes towards psychotic disorders. The MHLS score ranged from a minimum of 35 to a maximum of 160. The higher the score was, the better recognition about the mental health there would be.

#### **Statistical Analyses**

Data were summarized by using median with interquartile range (IQR) for continuous variables and frequency (%) for categorical variables. Bivariate logistic regressions were used to examine the associations between MHLS and HIV-related health outcomes as well as ART adherence. All analyses were performed with STATA statistical software, version 16.

## **Results**

A total of 406 participants were enrolled in the study. The baseline characteristics and the mental health literacy result are presented in Table 1. The median age of participants was 35 years (interquartile range (IQR), 30-41 years), and nearly one-third of the study subjects were female. Approximately 10% of participants had a history of intravenous drug use, and they all stopped this practice at study enrolment. Nearly two-thirds of participants completed high school education or above degrees. In addition, a majority of patients were working as part-time or full-time staff and received financial and mental support from family members. Nearly 61% of patients were living alone. The majority of patients were clinically stable. Most participants were under the well-controlled immunological condition with a recent sixmonth median CD4 of 603 cells/µl and HIV-RNA suppression (undetected HIV viral load threshold < 20 copies/ml) was observed in nearly two-thirds of the study subjects. Among

139 (34%) individuals with detected HIV viral loads, the median recent six-month HIV viral load measurement was 20 copies/ml, with an interquartile range from 20 to 25 copies/ml and with the minimum of 20 copies/ml to a maximum of 750 copies/ml. The median time from confirmed HIV diagnosis to study

enrolment was 5.8 years. In addition, the median time since ART initiation until study enrolment was 5.1 years (IQR, 2.2-7.7); thus, the interval from confirmed HIV diagnosis to ART initiation was estimated at roughly six months. The median MHLS score of participants was 99 (IQR, 93-107).

Characteristics	Statistics <sup>*</sup>		
Age, years	35 (30-41)		
Female, gender	123 (30.3)		
History of intravenous drug use, yes	40 (9.9)		
Educational status			
Primary school or less	37 (9.1)		
Secondary school	113 (27.8)		
High school or greater	256 (63.1)		
Employment status			
Full-time or part-time employed	363 (89.4)		
Currently unemployed or unable to work	43 (10.6)		
Marital status			
Married	160 (39.4)		
Single, widowed or divorced	300 (60.6)		
Financial and mental support from family	364 (89.7)		
members, yes			
Time since confirmed HIV diagnosis, years	5.8 (2.9-8.4)		
Duration of ART, years	5.1 (2.2-7.7)		
WHO HIV clinical stages			
Stage 1 and 2	376 (92.6)		
Stage 3 and 4	30 (7.4)		
CD4 counts at time of study enrolment,	603 (401-		
cells/µl	776)		
HIV-RNA suppression			
Undetected VL (< 20 copies/ml)	237/376 (63)		
Detected VL ( $\geq 20$ copies/ml)	139/376 (37)		
HIV viral load measurements (copies/ml)	20 (20-25)		
among detected cases			
Mental health literacy scale	99 (93-107)		

Table 1. Baseline Characteristics and MHLS among Study Participants (N=406)

\* Summary statistic is median (interquartile range) for continuous variables and frequency (%) for categorical variables

The associations between MHLS and HIVrelated treatment outcomes as well as antiretroviral adherence are presented in Table 2. The bivariate logistic regression analyses showed that MHLS was not statistically associated with all pre-specified HIV-related health outcomes, including WHO HIV clinical stages, HIV-RNA suppression, history of the first-line ART failure, and treatment adherence.

Outcomes	Subjects	POR*	P value <sup>**</sup>
	No. (%)	(95% CI)	
WHO HIV clinical stages			
Stage 1 and 2	376/406 (92.6)	Reference	0.07
Stage 3 and 4	30/406 (7.4)	0.97 (0.93-1.00)	
HIV-RNA suppression			
Undetected (< 20 copies/ml)	237/376 (63)	Reference	0.71
Detected ( $\geq 20$ copies/ml)	139/376 (37)	0.99 (0.98-1.02)	
Currently treated ART regimens			
The first-line ART	393/406 (96.8)	Reference	0.23
The second-line ART	13/406 (3.2)	0.97 (0.92-1.02)	
ART adherence			
Yes	374/406 (92.1)	Reference	0.87
No	32/406 (7.9)	0.99 (0.96-1.03)	

 Table 2. Associations between Mental Health Literacy Scale and HIV-related Treatment Outcomes and ART

 Adherence

\* POR: Prevalence odds ratios and 95% confidence interval of POR

\*\* P values: significance level < 0.05

### Discussion

Our study demonstrated that HIV-infected outpatients in our studied clinic had an intermediate mental health performance with a median MHLS score of 99 (IQR, 93-107). This finding was quite consistent with the previous report among the general Iranian population [21]. To our knowledge, numerous mental health literacy tools are currently applicable among various populations, depending on cultural differences [22-25]. We determined to use the MHLS constructed by O'Connor M. et al. in 2015 to evaluate the mental health performance of all participants in our study because this tool was reported to be both wellvalidated and appropriate with the culture of our population [19, 21, 26]. Several studies showed that such factors as age, gender, education levels, and familial status were associated with mental health literacy [22, 23]. In this regard, in comparison to the Iranian population, our study participants had slightly higher age, lower education levels, outnumbering male gender, and single, widowed or divorced status. Noticeably, all subjects were very cooperative, thoroughly focused on the MHLS questionnaire, and comprehensively answered all 35 items in the questionnaire. Importantly, the MHLS in our study revealed good internal and test-retest reliability with the overall Cronbach's alpha of closely 0.80, which was consistent with previous reports [19, 21, 26]. Therefore, the mental health literacy assessment in our study was well-performed, which was considered a crucial step for further examining its correlations with HIV-related health outcomes and treatment adherence.

Despite previous reports other in populations, ours is the first study in Vietnam to analyze the associations between the patients' mental health literacy and the significant HIV-related treatment outcomes. Several prior studies reported that health literacy was a significant predictor of individual HIV/AIDS knowledge and further correlated with antiretroviral adherence and HIV-related health outcomes [9-11,17,18]. On this basis, we hypothesized that there would be associations between mental health literacy and HIV-related treatment outcomes as well as treatment compliance. Nevertheless, previous studies showed disparate results in the correlation between mental health performance and ART adherence [11-18]. On the one hand, it was shown that there was a strong relationship between mental health literacy and ART compliance; on the other hand, other studies did not support such a correlation. The differences ART adherence assessments in and heterogeneous definitions in health literacy were taken into account for the inconsistencies among those studies [11-18]. In addition, there were considerable disparities in such factors as age, race, income, education, alcohol intake, and comorbidities among previous studies [12, 13, 15, 16]. Remarkably, the ART adherence assessment method used in this study was welldefined and widely applicable in many recent scientific reports for its reliability and accuracy. Our study showed that higher mental health literacy slightly improved patients' treatment adherence, clinical status, HIV-RNA suppression, and ART failure; nevertheless, the results were not statistically significant. Most importantly, there was no association between MHLS and HIV-RNA suppression, and this finding was similar to the result reported by Paasche-Orlow MK et al. in 2006 [16]. Hence, our initial study hypothesis was not met. The possible explanation might be the additive effects of the potential covariates, including age, education, alcohol use and other comorbidities. However, these factors are restrictively analyzed with the cross-sectional study design. In this respect, further prospective cohort studies with sufficient sample size and

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well adjustment for potential covariates are vital to elucidate the existing disparities.

The strengths of this study are that the study population and site were well representatives of an HIV community-based clinic in Vietnam, and the data collection was well-conducted with almost no missing value. However, our study has several limitations, including potential selection and information biases which are inherent to the cross-sectional study design. In addition, the temporal and causal relationships cannot be established with regard to potentially confounding covariates. Nonetheless, to some extent, our study still contributes to shortening the knowledge gap.

## Conclusion

The mental health performance among HIV/AIDS patients in the Vietnamese outpatient clinic settings was evaluated at the intermediate level. Mental health literacy was not statistically associated with HIV-related treatment outcomes.

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The study was self-funded.

## **Conflicts of Interest**

there is no conflict of interest.

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