

Original Article
Psychiatry & Psychology



Predictors Associated With HIV Status Non-Disclosure in Korea

Kyungmin Kim and Jungmin Woo

Department of Psychiatry, School of Medicine, Kyungpook National University, Daegu, Korea

OPEN ACCESS

Received: Oct 21, 2021

Accepted: Mar 25, 2022

Published online: Apr 12, 2022

Address for Correspondence:

Jungmin Woo, MD, PhD

Department of Psychiatry, School of Medicine,
Kyungpook National University, 130 Dongdeok-
ro, Jung-gu, Daegu 41944, Republic of Korea.
Email: woojm3@hanmail.net

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ORCID iDs

Kyungmin Kim

<https://orcid.org/0000-0001-9304-0404>

Jungmin Woo

<https://orcid.org/0000-0001-7180-9972>

Disclosure

The authors have no potential conflicts of
interest to disclose.

Author Contributions

Conceptualization: Kim K, Woo J. Data
curation: Kim K. Formal analysis: Kim K, Woo
J. Investigation: Kim K, Woo J. Methodology:
Kim K. Software: Kim K. Validation: Woo J.
Visualization: Kim K. Writing - original draft:
Kim K. Writing - review & editing: Kim K, Woo J.

ABSTRACT

Background: Human immunodeficiency virus (HIV) disclosure provides personal support to people living with HIV/acquired immunodeficiency syndrome (PLWH). In addition, it has important implications for disease prevention and treatment. Research on disclosure has been conducted worldwide; however, data from South Korea are insufficient. The purpose of this study was to examine whether certain demographic, medical, and psychosocial factors act as predictors of HIV serostatus non-disclosure among PLWH in South Korea.

Methods: Participants consisted of 147 PLWH who visited the outpatient infection clinic between June 2020 and January 2021. Demographics, medical factors, HIV-related stigma, and depressive and anxiety symptoms were measured.

Results: The overall disclosure rate among participants was 61.2%. Logistic regression analysis showed that lower depression (odds ratio [OR], 0.918; $P = 0.021$) and higher disclosure concerns (OR, 1.133; $P = 0.004$) were significant predictors of non-disclosure. Further, married state was a major predictor of non-disclosure when single referred (OR, 3.002; $P = 0.024$); however, divorce, separation, and widowed status had no significant consequences.

Conclusion: In South Korea, the rate of HIV disclosure is lower than in other countries. The higher disclosure concerns, lower depression and married state were suggested to be important predictors of HIV non-disclosure. High level of perceived stigma and experienced discrimination of PLWH may have affected the results. The social atmosphere linking sexual promiscuity and disease may also have influenced these results. Nationwide efforts should continue to reduce the overall stigma and create a social environment where PLWH can feel safe to disclose their disease conditions.

Keywords: HIV; Disclosure; Stigma; Anxiety; Depression

INTRODUCTION

Human immunodeficiency virus (HIV) status disclosure is an act that not only has an important personal meaning to people living with HIV/acquired immunodeficiency syndrome (AIDS) (PLWH) but also has a social significance. Disclosure can be a first step to allow PLWH to access social support.¹ Additionally, this can lead to safer sexual behavior that prevents the seroconversion of HIV-negative individuals,² better adherence to antiretroviral therapy (ART),

and less treatment failure.³ Despite these positive effects, disclosure can be a huge challenge to PLWH because it is associated with risks that lead to negative outcomes. It can lead to stigmatization, rejection, avoidance, physical harm, and negative social interactions, such as workplace discrimination. Additionally, it can impair psychosocial well-being in PLWH.^{4,5} Nevertheless, numerous studies report greater positive effects of disclosure than negative. In addition, previous studies have shown that PLWH usually do not regret their disclosure, which also supports its importance.^{6,7}

Depression is the most common psychiatric complication among PLWH; it is more than twice as prevalent than in the general population.⁸ Anxiety is also prevalent among PLWH. Previous studies have shown that these psychiatric complications are associated with risky sexual behavior, disease progression, and higher mortality rates among PLWH.^{9,10} Emotional well-being is an important factor influencing disclosure; several studies have tried to clarify this correlation. However, the evidence is mixed in differing study designs or differs according to the background of the participant group.^{5,11} HIV-related stigma is common among PLWH, which can lead to a loss of affective, behavioral and physical well-being.¹² Many studies, including one meta-analysis, have confirmed the negative correlation between perceived HIV-related stigma and disclosure in various research settings.^{5,13} Taken together, these data indicate that depression, anxiety, or stigma can act as major predictors of the disclosure of HIV status.

There may be common disclosure barriers worldwide; however, social context may account for some differences. A previous study has reported that race, ethnicity, and culture may play a role in the effects of disclosure.¹⁴ Therefore, it can be assumed that disclosure behavior barriers can be attributed to cultural differences. Studies dealing with HIV status disclosure have been conducted worldwide; however, to date, few studies have been conducted in South Korea. This lack of information means that the obstacles to the positive perception of disclosure are unknown. This can make it difficult to promote disclosure despite its many advantages. In the unique culture of Korea, people are reluctant to discuss sexual minorities or sexually transmitted infections; therefore, different barriers are expected compared with other countries.¹⁵ This study aimed to investigate the associated characteristics of HIV status disclosure in PLWH living in South Korea, including demographics, and clinical and psychosocial factors.

METHODS

Participants

The participants were 147 PLWH who visited the outpatient infection clinic in Kyungpook National University Hospital (KNUH), Daegu, South Korea, between June 2020 and January 2021. The inclusion criteria were: patients who had been diagnosed with HIV infection; currently being treated with an ART regimen; aged ≥ 20 years; able to provide written informed consent; and able to read and write in Korean.

Sociodemographic and clinical data

The demographic information of participants was reported, including age, gender, marriage, employment, monthly income, education, religion, HIV transmission route, experience with AIDS-related diseases, ART period from start, and ART adherence. This was measured using the question, "How often have you missed your medication in the last four weeks?" Responses were dichotomized as "Very good" if the answer was not more than once and "Not

very good” if the answer was more than once. Clinical data were extracted from the patient medical records. Total CD4 T cell counts (cell/ μ L) and HIV quantitative reverse transcription polymerase chain reaction (RT-PCR, copies/mL) were included.

Disclosed and non-disclosed group

Before starting the psychiatric measures, all participants were asked to answer the following question, “Have you ever informed anyone around you of your HIV infection?” Participants who had no experience in informing other people about their HIV/AIDS status were classified into the ‘non-disclosed group’ and others who had experienced disclosure were classified into the ‘disclosed group’. The participants of the non-disclosed group did not complete the ‘enacted stigma’ subscale in HIV Stigma Scale (HSS), which represents an experience-induced stigma among PLWH.

Measures

HIV related stigma

The revised HIV Stigma Scale (HSS-R) were used in this study.¹⁶ Several recent studies that have noted the stigma related to HIV use this measure.^{17,18} The HSS was first designed to measure the stigma perceived by individuals who were HIV-positive.¹⁹ The HSS-R, which was used in this study, has been shortened from the original 40 items to 32. It consists of four subscales: disclosure concerns, negative self-image, concern with public attitudes, and enacted stigma. Disclosure concerns are related to the perceived need to keep one’s own HIV information concealed. The negative self-image provides information about the feelings of guilt or shame of HIV-positive individuals have about being HIV infected. Concern with public attitudes relates to the beliefs that HIV-positive individuals have about other people’s opinions of them. Enacted stigma relates to the reactions from other individuals after HIV status disclosure. This is also related to the experience of rejection. This subscale was measured in the disclosed group alone.

Items for each subscale were rated using a four-point Likert scale ranging from 1 (strongly agree) to 4 (strongly disagree). In total, 32 items showed good overall internal consistency (0.897), which was measured using Cronbach’s alpha. Disclosure concerns (0.785), negative self-image (0.822), and concerns with public attitudes (0.834) showed good internal consistency. Enacted stigma (0.933) showed an excellent level of internal consistency. Bunn et al.¹⁶ has shown that Cronbach’s alpha for these subscales range from 0.90 to 0.97, with an overall value of 0.95.

Depression

Depressive symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9); we used the validated Korean version of the PHQ-9.²⁰ Several studies that assessed depression in HIV-positive individuals have used this measure.^{17,18} The PHQ-9 scale is half the length of many other depression measures and consists of nine criteria upon which the diagnosis of 4th Edition of Diagnostic and Statistical Manual of Mental Disorders major depressive disorder is based. It assesses how often the participants are bothered by symptoms related to depression in a two-week period. Nine items were scored using a 4-point Likert scale from 0 (not at all) to 3 (nearly every day). Total scores ranged from 0–27. High scores indicate a more severe degree of depression.

Anxiety

Anxiety symptoms were measured using the Generalized Anxiety Disorder-7 (GAD-7); the validated Korean version of GAD-7 was used in this study.²¹ Using a 4-point Likert scale from

0 (not at all) to 3 (nearly every day), participants were asked how often they experienced feelings of nervousness, worry, or restlessness in the past two weeks. Total scores ranged from 0–21. The higher the score, the higher the degree of anxiety.

Statistical analysis

First, preliminary analyses were performed to identify significant group differences within the sample. The χ^2 tests were conducted using the categorical variables – gender, marriage, employment, monthly income, education, religion, HIV transmission route, experience with AIDS related diseases, and ART adherence. Fisher's exact test was applied when > 20% of cells had expected frequencies lower than 5. Independent two sample t-tests were conducted for the continuous variables – ART period from start, total CD4 T-cell count, HIV quantitative RT-PCR, disclosure concerns, negative self-image, concern with public attitudes, depression, and anxiety. Pearson's correlation analysis was conducted for continuous variables, including enacted stigma.

Second, logistic regression analysis was performed to determine the predictors for non-disclosure of HIV serostatus. All the sociodemographic, medical, and psychological variables investigated in this study were included in the analysis to determine potential explanatory variables.

All statistical analyses were performed using SPSS version 21 for Windows (IBM Co., Armonk, NY, USA).

Ethics statement

This study was approved by the Institutional Review Board of Kyungpook National University Hospital (KNUH IRB file No. 2020-03-034). All participants provided informed consent written in Korean after the study had been fully explained.

RESULTS

Participant sociodemographic, clinical, psychiatric characteristics

The mean age of participants was 42.7 ± 12.5 years with the majority being male ($n = 142$, 96.6%). Most participants were single (68%), employed (65.3%), had a monthly income of 3 million won or less (66.7%), no religion (65.3%), did not experience AIDS-related diseases (68.7%), had a very good ART adherence (89.8%), and had disclosed their HIV serostatus to others (61.2%). Almost half of the participants reported their HIV transmission route via homosexual or bisexual behavior (45.6%). There were similar proportions of participants who continued their education after high school and those who did not. The mean ART period was 71.3 ± 58.6 , CD4 T-cell count (cells/ μ L) was 610.3 ± 428.7 , and HIV quantity using RT-PCR analysis was $8,544.9 \pm 87,642.9$ copies/mL. For the psychiatric measures, the mean PHQ-9 and GAD-7 scores were 5.9 ± 6.3 and 4.4 ± 4.8 , respectively. The mean HSS-R disclosure concern score was 25.2 ± 5.1 . The negative self-image and concern with public attitudes scores were 17.8 ± 4.9 and 19.0 ± 4.2 , respectively. Additionally, the mean enacted stigma among HIV serostatus disclosure group score ($n = 90$) was 23.2 ± 8.5 (Table 1).

The medical and psychosocial factors between the disclosed and non-disclosed groups

There was decreased disclosure in individuals who were married ($P < 0.001$) and had higher education levels ($P = 0.046$). Additionally, Depression (PHQ-9) ($P = 0.016$) was lower in the non-

Table 1. Demographic, clinical data and psychiatric measures of the study sample (N = 147)

Variables	Values
Age, yr	42.7 ± 12.5
Sex	
Male	142 (96.6)
Female	5 (3.4)
Marital status	
Single	100 (68.0)
Married	29 (19.7)
Separated/Divorced/Widowed	17 (11.6)
Employment	
Yes	96 (65.3)
No	49 (33.3)
Monthly income	
≤ 3 million won	98 (66.7)
> 3 million won	42 (28.6)
Education	
≤ High school	74 (50.3)
> High school	72 (49.0)
Religion	
Yes	50 (34.0)
No	96 (65.3)
HIV transmission route	
Homosexual/bisexual	67 (45.6)
Heterosexual	22 (15.0)
Injection/blood	1 (.7.0)
Don't know	55 (37.4)
Experience with AIDS related diseases	
Yes	46 (31.3)
No	101 (68.7)
ART adherence	
Very good	132 (89.8)
Not very good	15 (10.2)
Disclosure	
Disclosed	90 (61.2)
Non-disclosed	57 (38.8)
ART period from start, mon	71.3 ± 58.6
CD4 T-cell count, cells/μL	610.3 ± 428.7
HIV quantitative RT-PCR, copies/mL	8,544.9 ± 87,642.9
PHQ-9	5.9 ± 6.3
GAD-7	4.4 ± 4.8
HSS-R	
Disclosure concerns	25.2 ± 5.1
Negative self-image	17.8 ± 4.9
Concerns with public attitudes	19.0 ± 4.2
Enacted stigma (Disclosed group, n = 90)	23.2 ± 8.5

Values are expressed as mean ± standard deviation or number (%).

HIV = human immunodeficiency virus, AIDS = acquired immunodeficiency syndrome, ART = antiretroviral therapy, RT-PCR = reverse transcription polymerase chain reaction, PHQ-9 = Patient Health Questionnaire-9, GAD-7 = Generalized Anxiety Disorder-7, HSS-R = revised HIV Stigma Scale.

disclosed group than in the disclosed group. By contrast, age ($P=0.035$) and disclosure concerns ($P=0.003$) were higher in the non-disclosed group than in the disclosed group (Tables 2-4).

Correlation analysis of continuous variables

Enacted stigma, measured in the disclosed group alone, was significantly correlated with depression ($r=0.447$), anxiety ($r=0.415$), disclosure concerns ($r=0.492$), negative self-image ($r=0.421$), concerns with public attitudes ($r=0.418$), and age ($r=0.281$). Depression, measured in both groups was significantly correlated with anxiety ($r=0.850$), disclosure

Table 2. Results of χ^2 test comparing the medical and psychosocial factors between disclosed and non-disclosed group

Variables	Disclosed	Non-disclosed	χ^2	P
Marital status			15.249	< 0.001***
Single	66 (66.0)	34 (34.0)		
Married	9 (31.0)	20 (69.0)		
Divorced/separated/widowed	14 (82.4)	3 (17.6)		
Total	89 (61.0)	57 (39.0)		
Employment			0.661	0.416
Employed	56 (58.3)	40 (41.7)		
Unemployed	32 (65.3)	17 (34.7)		
Total	88 (60.7)	57 (39.3)		
Monthly income			0.036	0.850
Low	59 (60.2)	39 (39.8)		
High	26 (61.9)	16 (38.1)		
Total	85 (60.7)	55 (39.3)		
Education			3.995	0.046*
Low	51 (68.9)	23 (31.1)		
High	38 (52.8)	34 (47.2)		
Total	89 (61.0)	57 (39.0)		
Religion			0.280	0.597
Yes	29 (58.0)	21 (42.0)		
No	60 (62.5)	36 (37.5)		
Total	89 (61.0)	57 (39.0)		
Experience with AIDS related diseases			1.072	0.300
Yes	31 (67.4)	15 (32.6)		
No	59 (58.4)	42 (41.6)		
Total	90 (61.2)	57 (38.8)		
ART adherence			0.208	0.648
Very good	80 (60.6)	52 (39.4)		
Not very good	10 (66.7)	5 (33.3)		
Total	90 (61.2)	57 (38.8)		

Values are expressed as number (%).

AIDS = acquired immunodeficiency syndrome, ART = antiretroviral therapy.

* $P < 0.05$, *** $P < 0.001$.

concerns ($r = 0.169$), negative self-image ($r = 0.281$), concerns with public attitudes ($r = 0.310$), and ART duration ($r = 0.240$). Anxiety, measured in both groups, was correlated with disclosure concerns ($r = 0.182$), negative self-image ($r = 0.299$), concerns with public attitudes ($r = 0.317$), and ART duration ($r = 0.173$). Disclosure concerns were significantly correlated with negative self-image ($r = 0.479$) and concerns with public attitudes ($r = 0.646$). In addition, negative self-image and concerns with public attitudes were significantly correlated ($r = 0.541$). Participants' age showed some correlation with ART duration ($r = 0.366$; Table 5).

Table 3. Results of Fisher's exact test comparing the medical and psychosocial factors between disclosed and non-disclosed group

Variables	Disclosed	Non-disclosed	Fisher's exact test (P)
Sex			1.000
Male	87 (61.3)	55 (38.7)	
Female	3 (60.0)	2 (40.0)	
Total	90 (61.2)	57 (38.8)	
HIV transmission route (%)			0.805
Homosexual/bisexual	43 (64.2)	24 (35.8)	
Heterosexual	13 (59.1)	9 (40.9)	
Injection/blood	1 (100.0)	0 (0.0)	
Don't know	31 (56.4)	24 (43.6)	
Total	88 (60.7)	57 (39.3)	

Values are expressed as number (%).

HIV = human immunodeficiency virus.

Table 4. Results of independent two sample *t*-test comparing the medical and psychosocial factors between disclosed and non-disclosed group

Variables	Disclosed	Non-disclosed	t	P
No. of patients	90 (61.2)	57 (38.8)		
Age	40.99 ± 12.16	45.44 ± 12.67	-2.128	0.035*
ART period from start, mon	75.94 ± 63.49	64.05 ± 49.45	1.202	0.231
CD4 T-cell count, cells/ μ L	602.15 ± 287.83	623.05 ± 589.21	-0.287	0.774
HIV quantitative RT-PCR, copies/mL	2,216.17 ± 18,121.18	18,537.65 ± 139,062.16	-1.101	0.273
Depression (PHQ-9)	6.83 ± 6.58	4.39 ± 5.44	2.448	0.016*
Anxiety (GAD-7)	4.96 ± 5.14	3.53 ± 4.20	1.759	0.081
Disclosure concerns	24.18 ± 5.14	26.73 ± 4.68	-3.030	0.003**
Negative self-image	17.85 ± 5.13	17.82 ± 4.41	0.037	0.971
Concerns with public attitudes	18.58 ± 4.42	19.55 ± 3.81	-1.376	0.171

Values are expressed as mean ± standard deviation or number (%).

ART = antiretroviral therapy, HIV = human immunodeficiency virus, RT-PCR = reverse transcription polymerase chain reaction, PHQ-9 = Patient Health Questionnaire-9, GAD-7 = Generalized Anxiety Disorder-7.

P* < 0.05, *P* < 0.01.

Table 5. Results of Pearson correlation test for continuous variable

Variables	1	2	3	4	5	6	7	8	9	10
1. Enacted stigma ^a	1									
2. Depression	0.447**	1								
3. Anxiety	0.415**	0.850**	1							
4. Disclosure concerns	0.492**	0.169*	0.182*	1						
5. Negative self-image	0.421**	0.281**	0.299**	0.479**	1					
6. Concerns with public attitudes	0.418**	0.310**	0.317**	0.646**	0.541**	1				
7. Age	0.281**	-0.011	-0.053	0.031	0.023	0.016	1			
8. ART duration	0.178	0.240**	0.173*	-0.116	-0.046	-0.028	0.366**	1		
9. CD4+ T cell	-0.095	-0.071	-0.104	-0.046	-0.003	-0.028	-0.051	0.057	1	
10. HIV PCR quantitative	0.186	0.018	0.066	-0.057	-0.085	-0.142	-0.014	0.068	-0.031	1

ART = antiretroviral therapy, HIV = human immunodeficiency virus, PCR = polymerase chain reaction.

^aEnacted stigma (n = 90) measured only in disclosed group.

P* < 0.05, *P* < 0.01, ****P* < 0.001.

The predictors of non-disclosure of HIV serostatus

Logistic regression analysis indicated that lower depression (odds ratio [OR], 0.918; *P* = 0.021) and higher disclosure concerns (OR, 1.133; *P* = 0.004) were significant predictors of non-disclosure. Further, marriage was a major predictor of non-disclosure when unmarried individuals were referred (OR, 3.002; *P* = 0.024), but divorce, separation or widow had no significant consequences (Table 6).

DISCUSSION

Our study showed that the age and gender distribution of participants were similar to a previous HIV/AIDS cohort study conducted in South Korea.²²

Table 6. Results of Logistic regression analysis for factors predicting HIV status non-disclosure

Predictors	B	SE	OR	95%CI	P
HIV serostatus non-disclosure					
Depression	-0.086	0.037	0.918	(0.853-0.987)	0.021*
Disclosure concerns	0.125	0.043	1.133	(1.040-1.234)	0.004**
Marriage_Single (ref)					0.011*
Marriage_Married	1.099	0.485	3.002	(1.160-7.772)	0.024*
Marriage_Separated/Divorced/Widowed	-1.102	0.711	0.332	(0.083-1.339)	0.121
-2LL = 161.300; Nagelkerke R ² = 0.232; Hosmer & Lemeshow test: $\chi^2=13.189$ (<i>P</i> = 0.106)					

HIV = human immunodeficiency virus, SE = standard error, OR = odds ratio, CI = confidence interval.

P* < 0.05, *P* < 0.01.

As shown in the results, 61.2% of our study participants disclosed their HIV serostatus to at least one person. Similarly, a recent study of HIV disclosure in South Korea showed that only 54.7% of 148 participants reported disclosing their HIV status to their most trusted supporter.¹⁵ This is a significantly lower disclosure rate compared with studies that have been conducted in other countries. Previous research conducted in 12 countries over 5 continents have shown that 96% of respondents report having disclosed their HIV status to at least one person. The disclosure rate of other continents, except Asia-Pacific, is $\geq 90\%$. By contrast, the rate in the Asia-Pacific continent was 85%. Additionally, only 71% of 100 participants of South Korea reported their HIV status disclosure.⁶

There might be several factors that influence the low disclosure rate in Korea. A major influence is the difference in social perception and disease stigma between different countries and cultures. In our study, disclosure concerns were a significant in predicting non-disclosure. Disclosure concern is a perceived social stigma of PLWH that is closely related to the actual social perception of the disease. The social discrimination and stigma against HIV positive individuals remains a problem worldwide; however, this problem is more serious in Korea. A survey released in 2019 by the Korea Center for Disease and Prevention has reported that 52.4% of the 1,000 respondents said that they are reluctant to eat with individuals with HIV.²³ This result is different from the results of a US report assessing stigmatizing attitudes, which found that only 17.5% of respondents stated that they were afraid of casual contact with PLWH.²⁴ In a previous study, Asian-Pacific responders, including South Korea and Australia, reported more perceived stigma than other continents' responders. For example, they thought that other people believed HIV-infected individuals engaged in risky behaviors, such as sexual promiscuity, prostitution, or drug use.⁶ This higher perceived stigma is shown in our study; the disclosure concern, concerns with public attitudes, and negative self-image subscale scores were higher in all participants than in the results of a previous study conducted in the US.¹⁶ Previous studies have shown that increased perceived stigma is predictive of non-disclosure in PLWH.^{5,25}

In our study, as a result of the Fisher's exact test, there was no statistically significant difference between the disclosed and non-disclosed groups depending on the route of infection (**Table 3**). A small number of previous studies have studied the correlation between the disclosure of HIV serostatus and HIV transmission route, and studies on this have not been known in Korea. One study conducted in China suggested that in the case of individuals infected by sexual activity, there was a tendency to disclose their HIV status less than those infected by injection drug use (IUD) or blood transfusion. And it was interpreted that this may be the fear of participants infected by sexual activity receiving ethical criticism such as promiscuity from others after disclosure.²⁵ Other study conducted in Taiwan showed that the disclosure rate to at least one other person was higher in order of men having sex with men (MSM), heterosexual, and injection drug users. And it was interpreted that people with injected drug use would often not be able to gain support from their families due to their existing criminal history of illegal drug use.²⁶ In our study, only one person answered that there was an infection caused by blood or injection, and 37.4% of the respondents said they did not know the route of infection. In the future, if more participants are studied in multiple organizations, different research results could be obtained.

In this study, participants with more depressive symptoms tended to disclose their HIV status. Our finding appears to be contradictory to some of previous studies, as those studies show that HIV disclosure is inversely related to depression or depressive symptoms. One

study of HIV diagnosed African American women showed that perceived support from others and satisfaction with support mediated HIV disclosure and depression, HIV disclosure to others and depression were inversely correlated.²⁷ Another study of HIV patients in Uganda, showed that general disclosure and depression were negatively correlated.²⁸ The study with newly HIV-diagnosed MSM showed that depressive symptoms were negatively associated with disclosure to their sexual partners.²⁹ However, these previous studies can be said to be different from our study results in that they are obtained by subdividing the disclosure targets or the participants were limited to specific regions or genders. In this respect, our research results have something to understand more in the cultural context of Korea.

One hypothesis for our result is that disclosure may be the cause of depression but can be a result of it. Therefore, disclosure may occur in order to seek support in coping with depressive symptoms or the result of experienced stigma. And this assumption can be said to be in line with the result of one previous study which showed the positive correlation with HIV disclosure and depression.³⁰ We found that enacted stigma, which is a measure of experienced discrimination, had a higher association with depression than any other stigma subscales. Therefore, it is possible that depression is exacerbated by experienced stigma. Further, the positive association between enacted stigma and depression are shown in several previous studies.^{31,32} Another assumption is that non-disclosed participants tend to have difficulty revealing their depressive symptoms honestly, especially in individuals who find it difficult to reveal themselves to others. To support this hypothesis, further investigation into characteristics of this group is required. One review article has suggested that there is mixed evidence for the relationship between disclosure and psychological well-being. They argue that disclosure alone does not appear to benefit psychological well-being. Additionally, there may be a mediating process, including social support. Further studies examining this processes may provide this important information.⁵

The results showed that marriage is a major predictor for non-disclosure. A previous study indicated that 83% of all respondents in 5 continents disclosed their HIV status to their spouse or partner. By contrast, only 45% of South Korean respondents in this study shared their HIV status with their sexual partner. This may be due to the higher tendency to link HIV infection to sexual promiscuity in Pan-Asia than in other continental cultures. This may be a significant barrier in status disclosure for married people. Further, this may be related to the fears that disclosure would cause the loss of family or friends, which are significantly higher in the Asia-Pacific continent compared with other regions.⁶ According to a recent HIV-related perception and behavior survey, most Koreans perceive HIV infection as a filthy, shameful, and unspeakable disease.²³ This negative perception of the disease in Korea might cause married people not to disclose their HIV status to their spouse. Some studies have suggested that the greater intimacy of a relationship rather than the sexual partnership itself can be important factor in disclosure.^{33,34} This implies that both marital status and intimacy with the spouse can affect disclosure. Further research is required to confirm this.

Additionally, higher levels of education and older age were related with non-disclosure; however, they were not revealed as predictors of non-disclosure in the logistic regression analysis. Previous studies have shown a correlation between higher education level and lower disclosure rate, which might be influenced by higher self-stigma and cause a fear of disclosure.^{23,35} Another hypothesis is that highly educated people are more likely to have a high income and high employment security when compared with low educated people.³⁶ These people may feel at greater risk of losing a stable job if they disclose their HIV status.

Furthermore, several previous studies have suggested that older adults are more likely to not disclose their HIV status when compared with younger adults.^{37,38} This age difference may be attributed to the tendency of older adults to think that behavior related to HIV risk is morally wrong when compared with younger adults. Therefore, they are more concerned about public stigma.³⁹ However, the difference in mean age alone cannot be considered to reflect the difference in other age groups. Further studies are necessary to elucidate this.

There are several limitations in this study. First, there may be a selection bias in including the participants in the study. There is a possibility that the individuals who did not cooperate with the survey may be more reluctant to reveal their status or that their physical or emotional conditions were poor. Second, the study was based in a single center; therefore, further studies that include a larger sample size with multiple centers are required to validate our findings. Finally, this cross-sectional study can only reflect a correlation in the data. Causal inferences would require a longitudinal study. Despite these limitations, this study is of great significance because, to the best of our knowledge, it is one of the first studies to examine the factors that predict the disclosure of HIV status in Korea. Furthermore, we have shown differentiated results when compared with studies conducted in other countries.

Taken together, our data show that the rate of HIV disclosure is lower in South Korea than in other countries. The higher disclosure concerns, lower depression and married state were suggested to be important predictors of HIV non-disclosure. Higher disclosure concerns might be related to the perceived stigma of PLWH. The discrimination and stigma experienced by the people in disclosed group may have influenced their depression, or the depressed people may have sought to gain support by disclosing their illness. The cultural atmosphere that links HIV infection with sexual promiscuity may have prevented married people from disclosing their disease. Considering these predictors, it is a very important task to create a social atmosphere in which PLWH can relieve concerns about social prejudice and discrimination. Education continues to reduce the stigma of HIV and promote knowledge at the national level in South Korea. Recently, a reduction in personal levels of stigma and increased knowledge about HIV infection has been shown; however, the social stigma remained problematic.^{23,40} Nationwide efforts should continue in the public and health care institutions to reduce overall stigma and create a social environment where PLWH feel safe to disclose their disease status.

ACKNOWLEDGMENTS

The authors thank the patients who participated in our survey. We also appreciate Dr. Hyo Deog Rim and Seoyoung Jang (both Department of Psychiatry, School of Medicine, Kyungpook National University), Dr. Shin-Woo Kim and Dr. Hyun-ha Chang (both Department of Internal medicine, School of Medicine, Kyungpook National University) for assisting with data collection.

REFERENCES

1. Zea MC, Reisen CA, Poppen PJ, Bianchi FT, Echeverry JJ. Disclosure of HIV status and psychological well-being among Latino gay and bisexual men. *AIDS Behav* 2005;9(1):15-26.

[PUBMED](#) | [CROSSREF](#)

2. Simoni JM, Pantalone DW. HIV disclosure and safer sex. In: Kalichman SC, editor. *Positive Prevention: Reducing HIV Transmission among People Living with HIV/AIDS*. Boston, MA, USA: Springer; 2005, 65-98.
3. Yu Y, Luo D, Chen X, Huang Z, Wang M, Xiao S. Medication adherence to antiretroviral therapy among newly treated people living with HIV. *BMC Public Health* 2018;18(1):825.
[PUBMED](#) | [CROSSREF](#)
4. Préau M, Beaulieu-Prévost D, Henry E, Bernier A, Veillette-Bourbeau L, Otis J. HIV serostatus disclosure: development and validation of indicators considering target and modality. Results from a community-based research in 5 countries. *Soc Sci Med* 2015;146:137-46.
[PUBMED](#) | [CROSSREF](#)
5. Chaudoir SR, Fisher JD, Simoni JM. Understanding HIV disclosure: a review and application of the Disclosure Processes Model. *Soc Sci Med* 2011;72(10):1618-29.
[PUBMED](#) | [CROSSREF](#)
6. Nachega JB, Morroni C, Zuniga JM, Sherer R, Beyrer C, Solomon S, et al. HIV-related stigma, isolation, discrimination, and serostatus disclosure: a global survey of 2035 HIV-infected adults. *J Int Assoc Physicians AIDS Care (Chic)* 2012;11(3):172-8.
[PUBMED](#) | [CROSSREF](#)
7. Henry E, Bernier A, Lazar F, Matamba G, Loukid M, Bonifaz C, et al. "Was it a mistake to tell others that you are infected with HIV?": factors associated with regret following HIV disclosure among people living with HIV in five countries (Mali, Morocco, Democratic Republic of the Congo, Ecuador and Romania). Results from a community-based research. *AIDS Behav* 2015;19(2):311-21.
[PUBMED](#) | [CROSSREF](#)
8. Nanni MG, Caruso R, Mitchell AJ, Meggiolaro E, Grassi L. Depression in HIV infected patients: a review. *Curr Psychiatry Rep* 2015;17(1):530.
[PUBMED](#) | [CROSSREF](#)
9. Ezeamama AE, Woolfork MN, Guwatudde D, Bagenda D, Manabe YC, Fawzi WW, et al. Depressive and anxiety symptoms predict sustained quality of life deficits in HIV-positive Ugandan adults despite antiretroviral therapy: a prospective cohort study. *Medicine (Baltimore)* 2016;95(9):e2525.
[PUBMED](#) | [CROSSREF](#)
10. Hill LM, Maman S, Kilonzo MN, Kajula LJ. Anxiety and depression strongly associated with sexual risk behaviors among networks of young men in Dar es Salaam, Tanzania. *AIDS Care* 2017;29(2):252-8.
[PUBMED](#) | [CROSSREF](#)
11. Brittain K, Mellins CA, Remien RH, Phillips T, Zerbe A, Abrams EJ, et al. HIV-status disclosure and depression in the context of unintended pregnancy among South African women. *Glob Public Health* 2019;14(8):1087-97.
[PUBMED](#) | [CROSSREF](#)
12. Earnshaw VA, Chaudoir SR. From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS Behav* 2009;13(6):1160-77.
[PUBMED](#) | [CROSSREF](#)
13. Smith R, Rossetto K, Peterson BL. A meta-analysis of disclosure of one's HIV-positive status, stigma and social support. *AIDS Care* 2008;20(10):1266-75.
[PUBMED](#) | [CROSSREF](#)
14. Hult JR, Wrubel J, Bränström R, Acree M, Moskowitz JT. Disclosure and nondisclosure among people newly diagnosed with HIV: an analysis from a stress and coping perspective. *AIDS Patient Care STDS* 2012;26(3):181-90.
[PUBMED](#) | [CROSSREF](#)
15. Kim GS, Shim MS, Yi J. Using decision tree analysis to understand the influence of social networks on disclosure of HIV infection status. *AIDS Care* 2022;34(1):118-26.
[PUBMED](#) | [CROSSREF](#)
16. Bunn JY, Solomon SE, Miller C, Forehand R. Measurement of stigma in people with HIV: a reexamination of the HIV Stigma Scale. *AIDS Educ Prev* 2007;19(3):198-208.
[PUBMED](#) | [CROSSREF](#)
17. Chapman Lambert C, Westfall A, Modi R, Amico RK, Golin C, Keruly J, et al. HIV-related stigma, depression, and social support are associated with health-related quality of life among patients newly entering HIV care. *AIDS Care* 2020;32(6):681-8.
[PUBMED](#) | [CROSSREF](#)
18. Turan B, Crockett KB, Buyukcan-Tetik A, Kempf MC, Konkle-Parker D, Wilson TE, et al. Buffering internalization of HIV Stigma: implications for treatment adherence and depression. *J Acquir Immune Defic Syndr* 2019;80(3):284-91.
[PUBMED](#) | [CROSSREF](#)

19. Berger BE, Ferrans CE, Lashley FR. Measuring stigma in people with HIV: psychometric assessment of the HIV stigma scale. *Res Nurs Health* 2001;24(6):518-29.
[PUBMED](#) | [CROSSREF](#)
20. Han C, Jo SA, Kwak JH, Pae CU, Steffens D, Jo I, et al. Validation of the Patient Health Questionnaire-9 Korean version in the elderly population: the Ansan Geriatric study. *Compr Psychiatry* 2008;49(2):218-23.
[PUBMED](#) | [CROSSREF](#)
21. Ahn JK, Kim Y, Choi KH. The psychometric properties and clinical utility of the Korean version of GAD-7 and GAD-2. *Front Psychiatry* 2019;10:127.
[PUBMED](#) | [CROSSREF](#)
22. Choi BY, Choi JY, Han SH, Kim SI, Kee MK, Kim MJ, et al. Korea HIV/AIDS cohort study: study design and baseline characteristics. *Epidemiol Health* 2018;40:e2018023.
[PUBMED](#) | [CROSSREF](#)
23. Cha J, Hwang SH, Oh EJ, Yun J, Kong I. State public relations policy for AIDS prevention in South Korea. *Public Health Wkly Rep* 2019;12(48):2151-59.
24. Pitasi MA, Chavez PR, DiNenno EA, Jeffries WL 4th, Johnson CH, Demeke H, et al. Stigmatizing attitudes toward people living with HIV among adults and adolescents in the United States. *AIDS Behav* 2018;22(12):3887-91.
[PUBMED](#) | [CROSSREF](#)
25. Yin Y, Yang H, Xie X, Wang H, Nie A, Chen H. Status and associated characteristics of HIV disclosure among people living with HIV/AIDS in Liangshan, China: a cross-sectional study. *Medicine (Baltimore)* 2019;98(31):e16681.
[PUBMED](#) | [CROSSREF](#)
26. Ko NY, Lee HC, Hsu ST, Wang WL, Huang MC, Ko WC. Differences in HIV disclosure by modes of transmission in Taiwanese families. *AIDS Care* 2007;19(6):791-8.
[PUBMED](#) | [CROSSREF](#)
27. Vyavaharkar M, Moneyham L, Corwin S, Tavakoli A, Saunders R, Annang L. HIV-disclosure, social support, and depression among HIV-infected African American women living in the rural southeastern United States. *AIDS Educ Prev* 2011;23(1):78-90.
[PUBMED](#) | [CROSSREF](#)
28. Okello ES, Wagner GJ, Ghosh-Dastidar B, Garnett J, Akena D, Nakasujja N, et al. Depression, internalized HIV stigma and HIV disclosure. *World J AIDS* 2015;5(1):30-40.
[CROSSREF](#)
29. Abler L, Sikkema KJ, Watt MH, Hansen NB, Wilson PA, Kochman A. Depression and HIV serostatus disclosure to sexual partners among newly HIV-diagnosed men who have sex with men. *AIDS Patient Care STDS* 2015;29(10):550-8.
[PUBMED](#) | [CROSSREF](#)
30. Feuillet P, Lert F, Tron L, Aubriere C, Spire B, Dray-Spira R, et al. Prevalence of and factors associated with depression among people living with HIV in France. *HIV Med* 2017;18(6):383-94.
[PUBMED](#) | [CROSSREF](#)
31. Charles B, Jeyaseelan L, Pandian AK, Sam AE, Thenmozhi M, Jayaseelan V. Association between stigma, depression and quality of life of people living with HIV/AIDS (PLHA) in South India - a community based cross sectional study. *BMC Public Health* 2012;12(1):463.
[PUBMED](#) | [CROSSREF](#)
32. Jeyaseelan L, Kumar S, Mohanraj R, Rebekah G, Rao D, Manhart LE. Assessing HIV/AIDS stigma in south India: validation and abridgement of the Berger HIV Stigma scale. *AIDS Behav* 2013;17(1):434-43.
[PUBMED](#) | [CROSSREF](#)
33. Marks G, Crepaz N. HIV-positive men's sexual practices in the context of self-disclosure of HIV status. *J Acquir Immune Defic Syndr* 2001;27(1):79-85.
[PUBMED](#) | [CROSSREF](#)
34. Zea MC, Reisen CA, Poppen PJ, Echeverry JJ, Bianchi FT. Disclosure of HIV-positive status to Latino gay men's social networks. *Am J Community Psychol* 2004;33(1-2):107-16.
[PUBMED](#) | [CROSSREF](#)
35. Nobre N, Pereira M, Roine RP, Sutinen J, Sintonen H. HIV-related self-stigma and health-related quality of life of people living with HIV in Finland. *J Assoc Nurses AIDS Care* 2018;29(2):254-65.
[PUBMED](#) | [CROSSREF](#)
36. OECD. *Education at a Glance 2020: OECD Indicators*. Paris, France: OECD Publishing; 2020.
37. Nokes KM, Holzemer WL, Corless IB, Bakken S, Brown MA, Powell-Cope GM, et al. Health-related quality of life in persons younger and older than 50 who are living with HIV/AIDS. *Res Aging* 2000;22(3):290-310.
[CROSSREF](#)

38. Emler CA. A comparison of HIV stigma and disclosure patterns between older and younger adults living with HIV/AIDS. *AIDS Patient Care STDS* 2006;20(5):350-8.
[PUBMED](#) | [CROSSREF](#)
39. Solomon K. Psychosocial issues. In: Nokes KM, editor. *HIV/AIDS and the Older Adult*. New York, NY, USA: Taylor & Francis; 2020, 33-46.
40. Jang S, Rim HD, Kim K, Kim BS, Woo J. Psychiatric understanding and treatment consideration in HIV infection. *J Korean Soc Biol Ther Psychiatry* 2020;26(3):184-94.
[CROSSREF](#)