

# Psychosocial Features Affecting Suicidal Ideation Among Human Immunodeficiency Virus–infected Older Adults\*

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## I. INTRODUCTION

Patients infected with human immunodeficiency virus (HIV) are at risk of mental illness due to social stigma, poor social support, stress related to difficult life events, as well as physical changes caused by HIV infection (Bhatia & Munjal, 2014; Kang & Yang, 2022). Since suicidal behaviors often occur after HIV infection is diagnosed (Kang et al., 2016), interventions should reduce risk factors and enhance protective factors for suicidal behaviors in HIV-infected patients (Lu et al., 2019). The spectrum of suicidal behaviors ranges from suicidal ideation to attempted and completed, and suicidal ideation is an important predictor of attempted and completed suicide (Poster et al., 2011). Therefore, it is necessary to identify

significant factors associated with suicidal ideation in HIV-infected patients.

South Korea has an extremely high suicide rate relative to other Organization for Economic Cooperation and Development (OECD) countries. Suicide among the elderly is a major contributing factor; therefore, it is considered a serious public health issue in Korea (Kim et al., 2020). Factors for suicidal behavior, especially suicidal ideation, have been identified. A Korean longitudinal study on suicidal ideation in the elderly showed that unmarried status, unemployment, lower monthly income, stressful life events, physical illness, depressive symptoms, and social support deficits are independently associated with suicidal ideation (Kang et al., 2014). In Korea, many older people are socially and economically isolated or suffer from painful

\* This study was supported by the BK21 four project (Center for Human-Caring Nurse Leaders for the Future) funded by the Ministry of Education (MOE, Korea) and National Research Foundation of Korea (NRF).

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• Received: 23 February 2023 • Revised: 5 April 2023 • Accepted: 25 April 2023

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situations, which can cause them to experience persistent suicidal ideation (Kang et al., 2014). In the case of HIV-infected older people, the situation can be even more serious.

In Korea, where the prevalence of HIV infection is relatively low, the HIV-infected population is gradually aging (Choi, 2017). Furthermore, many HIV-infected people suffer from social isolation because of the intense social prejudice against homosexuality that is prevalent in Korean society, and the stigmatization of individuals with sexually transmitted diseases (Choi, 2017). Because the synergistic effects of aging and HIV may put older adults at greater risk for suicidal ideation, factors such as stigma, loneliness, decreased social support, declining health, and financial distress may be associated with suicidal ideation (Vance, Moneyham, Fordham, & Struzick, 2008). Despite the vulnerability of HIV-infected older adults to suicidal ideation, few studies have looked at the factors associated with suicidal ideation (Kalichman, Heckman, Kochman, Sikkema, & Bergholte, 2000). In Korea, few studies have investigated suicide ideation factors in older adults infected with HIV.

We explored the risk factors for suicidal ideation in HIV-infected adults aged 50 years and older, considering various factors previously known to affect suicidal ideation in the elderly (Kalichman et al., 2000; Kang et al., 2016; Kang et al., 2014; Shim et al., 2019). The Centers for Disease Control and Prevention (CDC) has defined a person aged 50 years and older as an “older adult” in HIV-infected people because of the vulnerability associated with their HIV-infected status (Nokes et al., 2011). We examined the associations between suicidal ideation and sociodemographic, HIV-related, health-related, and psychosocial characteristics among

HIV-infected older adults in Korea.

## II. METHODS

### 1. Participants

The data are from a cross-sectional survey carried out throughout the city by the Seoul Metropolitan Government. The survey was conducted between February and March 2013. Participants were selected based on the last digit of the registration number assigned by the Korea Centers for Disease Control and Prevention (KCDC). Among HIV-infected individuals living in Seoul registered in 2013, approximately 500 were selected as a result of sampling of 25% of those with an odd number at the end of their registration number. Individuals were eligible to participate if they had a positive HIV diagnosis and were aged 20 years or older, lived in Seoul, were native Koreans, and were capable of providing informed consent. Because public health centers are responsible for providing medical payments and counseling for HIV-infected people living in their districts, public health centers in charge of counseling people infected with HIV checked whether the selection criteria were met. The public officials checked whether the subject had psycho-cognitive problems and could provide informed consent, as well as their age and nationality. As a result, a total of 444 HIV-infected adults completed the survey, of whom 182 were aged 50 years or older and were included in the analysis. The number of survey subjects was determined considering the workload of public health center officials. A procedure for calculating the sample size was not considered.

### 2. Data collection

Participants completed a one-hour face-to-face interview following informed consent. Public health center officials in charge of counseling HIV patients received compulsory training in the procedures and methods of a structured interview. Trained officials administered the structured interviews using a questionnaire in each of the 25 district public health centers in Seoul. The questionnaire comprised sociodemographic, HIV-related, health-related, and psychosocial characteristics. A questionnaire included measurement items used in domestic and foreign studies. The questionnaire was prepared in the Korean language, pretested, and validated in consultation with two public health professionals.

A range of sociodemographic and HIV-related characteristics that may be associated with suicidal ideation was examined (Kang et al., 2016; Kang et al., 2014). The sociodemographic variables were age, sex, living arrangement (alone or not), monthly income (< ₩ 1 million or ≥ ₩ 1 million), educational level (< high school, high school diploma, or ≥ college), employment status (employed or not), and insurance status (National Medical Aid or National Health Insurance). The HIV-related characteristics were duration since HIV diagnosis (≤5 or >5 years), most recent cluster of differentiation 4 (CD4) cell count (≤350 or >350 cells/L), history of acquired immune deficiency syndrome (AIDS)-defining opportunistic disease, and history of antiretroviral therapy (ART) interruption due to side effects since HIV diagnosis.

The health-related characteristics of physical activity, total sleep time, and co-occurring chronic diseases were assessed. Physical activity and total sleep time are potentially associated with suicidal ideation (Hong & Lee, 2020; Michaels et al., 2017). The walking practice was analyzed as an index of physical activity. This

was defined as =10min/day of walking for more than 5 days in the past week (Ministry of Health and Welfare, 2014), and walking practice was categorized into two groups (performed or not). Total sleep time was categorized into two groups (within the normal range or not). Out of the normal range was defined as <6 or ≥9-hour average sleep duration in 24 hours in the past week (Hong & Lee, 2020). Because physical illness can be linked to suicidal ideation (Conwell, Van Orden, & Caine, 2011), the number of co-occurring chronic diseases in the past year was categorized into two groups (1 or ≥2).

A range of psychosocial characteristics, including perceived belongingness, perceived discrimination, social support, and psychological functioning, is significantly associated with suicidal ideation (Conwell et al., 2011; Kang et al., 2016; Shim et al., 2019; Vance et al., 2008). Psychosocial variables were rated on a four-point scale (strongly disagree, somewhat disagree, somewhat agree, and strongly agree). Perceived belongingness was measured by two items: participants were asked whether they felt accepted and approved by people they know and whether they felt as if people they know treated them respectfully. Perceived discrimination was measured by two items: participants were asked if they ever felt neglected due to their HIV status and if they felt discriminated against because of their HIV status. Social support was measured by two items: participants were asked if they were satisfied with the support of family or friends and if family or friends helped them remember to take antiretroviral drugs. Psychological functioning was assessed using the items developed by Duong *et al.* (Duong et al., 2001). The 10 items were translated into Korean and tested (Kim, 2013). Psychological functioning

was assessed by asking whether the subject had felt: (1) upset because of unexpected happenings, (2) out of control, (3) nervous and stressed, (4) confident to handle personal problems, (5) things were going their way, (6) they could not cope, (7) able to control irritations, (8) able to stay on top of things, (9) angered because of things that happened outside of control, and (10) problems were piling up over the last month. Reverse coding was performed where required (1, 2, 3, 6, 9, and 10). Higher composite scores point to improved psychological functioning (Cronbach's  $\alpha=.77$ ).

Because depression is closely associated with suicidal behavior, the history of treatment for depression was measured (yes or no). Suicidal ideation was assessed using binary yes or no answers: participants were asked if they had ever given serious consideration to suicide since their HIV diagnosis.

### 3. Ethical considerations

The study has been approved by the Institutional Review Board of the Seoul National University (IRB No. 1406-097-589). To protect personal confidentiality and autonomy, the purpose and contents of the survey were explained in a separate room of the public health center, and the decision was made on whether to participate in the survey. Because HIV-infected people extremely refused to disclose information that they are HIV-infected, the survey was conducted after obtaining verbal consent to participate in the survey. Confidentiality is important to HIV-infected people and obtaining written consent can leave evidence of their status. Because the survey did not include a procedure or treatment that required written consent, public officials obtained verbal consent.

When individuals with depressive symptoms and suicidal ideation were detected, public officials referred them to the counseling services of medical institutions. In Korea, medical institutions with a Division of Infectious Diseases provide professional counseling to HIV-infected patients.

### 4. Data analysis

Statistical analysis was performed using SPSS 25 program. Descriptive data are presented in the form of frequencies and percentages, medians and interquartile ranges (IQRs), or means and standard deviations (SDs). To reliably detect possible differences, univariate analysis was performed considering the significance level as a  $p<.10$ . Potential associated factors with a  $p<.10$  in a multivariate logistic regression analysis were entered in the multivariate logistic regression analysis to examine independence. Statistical associations and strength are presented as adjusted odds ratios (aORs) with a 95% confidence interval (CI) and  $p$ -value. A two-tailed  $p<.05$  was considered statistically significant. The fit of the model was evaluated by the Hosmer-Lemeshow goodness-of-fit test.

## III. RESULTS

### 1. Participants' characteristics

The prevalence of suicidal ideation was 37.4% ( $n=68$ ) in the 182 participants. Most participants were males (90.1%), and the median age was 60 years (IQR, 56–66 years). The participant's ages ranged from 50–85 (50–59 years, 49.5%;  $\geq 60$  years, 50.5%). The number of individuals living alone was 64 (35.2%), the unemployed was 88 (48.4%), and National Medical Aid beneficiaries

were 35 (19.2%). The median time since HIV diagnosis was 8 years (IQR, 4.75-11.25 years). Of the 182 participants, 32 (17.6%) reported a history of AIDS-defining opportunistic disease. The majority, 129 (70.9%), of the participants reported at most one co-occurring chronic disease, and the others reported two or more co-occurring chronic diseases. The median total sleep duration was 7 hours (IQR, 6-8 hours), and ranged from 4 to 12 hours. Of the 182 subjects, 17 (9.3%) had been treated for depression since their HIV diagnosis. The sociodemographic, HIV-related, health-related, and psychosocial characteristics of the participants are listed in Table 1.

## 2. Factors associated with suicidal ideation among HIV-infected older adults

In the univariate logistic regression analyses, a less than ₩ 1 million monthly income ( $p=.058$ ), unemployment ( $p=.002$ ), National Medical Aid beneficiary ( $p=.003$ ), history of AIDS-defining opportunistic disease ( $p=.006$ ), non-performance of walking practice ( $p=.046$ ), sleep duration out of the normal range ( $<6$  or  $9$  hours) ( $p=.010$ ), two or more co-occurring chronic diseases ( $p=.016$ ), history of depression treatment ( $p=.002$ ), lower perceived belongingness ( $p<.001$ ), higher perceived discrimination ( $p=.048$ ), lower social support ( $p<.001$ ), and lower psychological functioning ( $p<.001$ ) had increased ORs for suicidal ideation (Table 2).

Multivariate logistic regression analysis showed that independent factors for suicidal ideation were unemployment (adjusted odds ratio [aOR], 3.34; 95% confidence interval [CI], 1.16-9.57), history of depression treatment (aOR, 4.61; 95% CI, 1.02-20.66), perceived belongingness (aOR, 0.63; 95% CI, 0.41-0.99), and psychological

functioning (aOR, 0.85, 95% CI, 0.73-0.99). The Hosmer-Lemeshow test indicated that the multivariate logistic regression model was suitable ( $\chi^2=3.32$ ,  $p=.912$ ). There was no indication of multicollinearity ( $1.10 < VIF < 2.25$ ), and the Nagelkerke  $R^2$  of the full model was .367 and  $p <.001$ .

## IV. DISCUSSION

In this study, unemployment and perceived belongingness were associated with suicidal ideation among HIV-infected older adults. Durkheim's theory of suicide, which has dominated studies of suicide (Tartaro & Lester, 2005), proposed that old age is strongly related to suicide. This may be explained by causal associations between social integration, an endured sense of not being interconnected to their own community, and suicide (Durkheim, 2005). The loss of a work role that occurs in older age is an overarching life-course transition that can cause social integrations to weaken (Pillemer, Moen, Glasgow, & Wethington, 2000). In Korea, in the case of the elderly, economic instability seems to act as a particularly important factor in suicide (Kim et al., 2020), so whether the elderly are employed can be a major variable in determining their quality of life. Therefore, the loss of a work role may lead to disconnection from society, which may promote suicidal ideation.

The need to belong, a fundamental human need, can be countered by the sense of disconnection or being uncared for by others (Baumeister & Leary, 2017). When this need is met, it may prevent suicide, but when countered, it may increase the risk of suicide (Joiner, 2007). Thwarted belongingness may be associated with suicidal behavior in older adults (Kinory, Aisenberg, &

Levi-Belz, 2020) and HIV-infected patients (Shim et al., 2019). Thwarted belongingness represents an intense feeling of loneliness (Dieserud,

Rysamb, Ekeberg, & Kraft, 2001; Stravynski & Boyer, 2001; Waern, Rubenowitz, & Wilhelmson, 2003), and loneliness tends to increase with age

Table 1. Characteristics of HIV-Infected Older Adults Living in Seoul, 2013

Variable	Group	Total n or M±SD	Suicidal ideation n(%) or M±SD
Total		182	68 (37.4)
Age	50–59yr	90	37 (41.1)
	≥60yr	92	31 (33.7)
Sex	Male	164	62 (37.8)
	Female	18	6 (33.3)
Living arrangement	Alone	64	29 (45.3)
	Not alone	118	39 (33.1)
Monthly income	<₩1 Million	104	45 (43.3)
	≥₩1 Million	78	23 (29.5)
Educational level	Less than high school	63	22 (34.9)
	High school diploma	76	33 (43.4)
	More than College	43	13 (30.2)
Employment status	Unemployed	88	43 (48.9)
	Employed	94	25 (26.6)
Insurance status	National Medical Aid	35	21 (60.0)
	National Health Insurance	147	47 (32.0)
Duration since HIV diagnosis	≤5 years	62	26 (41.9)
	>5 years	120	42 (35.0)
Recent CD4 cell count	≤350 cells/μL	33	12 (36.4)
	>350 cells/μL	149	56 (37.6)
AIDS-defining opportunistic disease	Yes	32	19 (59.4)
	No	150	49 (32.7)
ART interruption due to side effects	Yes	24	12 (50.0)
	No	158	56 (35.4)
Walking practice	Performed	103	32 (31.1)
	Unperformed	79	36 (45.6)
Total sleep time	<6 or ≥9 hours	40	22 (55.0)
	6–8 hours	142	46 (32.4)
Co-occurring chronic diseases	1	129	41 (31.8)
	≥2	53	27 (50.9)
Depression treatment	Yes	17	13 (76.5)
	No	165	55 (33.3)
Mean perceived belongingness (±SD)		5.10 ± 1.13	4.56 ± 1.18
Mean perceived discrimination (±SD)		4.42 ± 1.19	4.65 ± 1.34
Mean social support (±SD)		4.46 ± 1.42	3.90 ± 1.40
Mean psychological functioning (±SD)		25.93 ± 3.43	24.34 ± 3.57

The percentages in the table represent the proportion of suicidal ideation within subgroups for each variable. AIDS = acquired immune deficiency syndrome; ART = antiretroviral therapy; CD4 = cluster of differentiation 4; HIV = Human immunodeficiency virus; SD = standard deviation

(Hawkey & Cacioppo, 2007). HIV-infected people suffer from loneliness and feelings of isolation (Shippy & Karpiak, 2005); therefore, their unmet need to belong may exceed their coping mechanisms and increase their risk for suicidal ideation (Vance et al., 2008). Our research suggests that considering unemployment as a predisposing factor and perceived belongingness as a buffer for reducing suicidal ideation may prevent suicide in HIV-infected older adults.

Consistent with previous studies, our data reveal that HIV-infected older adults with lower psychological functioning and a history of depression reported suicidal ideation more frequently. Psychological distress and depression

are closely associated with suicidal behaviors among older adults (Conwell et al., 2011; Handley et al., 2014). Indeed, HIV-infected older adults who reported suicidal ideation experienced greater emotional distress and were significantly less likely to use positive reappraisal coping (Kalichman et al., 2000). Furthermore, the effects of sociodemographic and health-related variables that were related to suicidal ideation were not significant in the adjusted model because of the effect of psychological functioning. This indicates that psychological status has a marked influence on suicidal ideation among HIV-infected older adults.

This study has several limitations. Its cross-sectional design means that the causality

Table 2. Factors Associated with Suicidal Ideation among HIV-Infected Older Adults Living in Seoul, 2013

Variable	Group	Univariate logistic analysis			Multivariate logistic analysis		
		OR	95% CI	p	aOR	95% CI	p
Monthly income	< ₩1 Million	1.82	0.97-3.39	.058	0.35	0.11-1.09	.070
	≥ ₩1 Million	1			1		
Employment status	Unemployed	2.63	1.41-4.90	.002	3.34	1.16-9.57	.025
	Employed	1			1		
Insurance status	National Medical Aid	3.19	1.49-6.82	.003	1.08	0.38-3.09	.873
	National Health Insurance	1			1		
AIDS-defining opportunistic disease	Yes	3.01	1.37-6.59	.006	2.24	0.85-5.89	.101
	No	1			1		
Walking practice	Unperformed	1.85	1.01-3.41	.046	0.93	0.43-2.02	.873
	Performed	1			1		
Total sleep time	<6 or ≥9 hours	2.55	1.24-5.21	.010	2.11	0.86-5.20	.103
	6-8 hours	1			1		
Co-occurring chronic diseases	≥2	2.22	1.15-4.28	.016	0.86	0.35-2.09	.748
	1	1			1		
Depression treatment	Yes	6.50	2.02-20.86	.002	4.61	1.02-20.66	.046
	No	1			1		
Perceived belongingness		0.47	0.34-0.65	<.001	0.63	0.41-0.99	.047
Perceived discrimination		1.30	1.00-1.68	.048	0.91	0.63-1.30	.611
Social support		0.62	0.49-0.78	<.001	0.77	0.56-1.04	.093
Psychological functioning		0.77	0.69-0.86	<.001	0.85	0.73-0.99	.035

AIDS = acquired immune deficiency syndrome; aOR = adjusted odds ratio; CI = confidence interval; HIV = Human immunodeficiency virus; OR = odds ratio

of associations with suicidal ideation could not be determined. HIV-infected adults with severe physical illness or psychiatric disorders were less likely to participate in this study, resulting in a possible underestimation of variables. Since the survey was conducted about 10 years ago, the result of the study could not reflect the current situation. This study was also limited by the use of self-reported and less sophisticated measures to assess psychosocial characteristics. Indeed, two items may not be sufficient to measure psychosocial features such as perceived discrimination, perceived belongingness, and social support; however, it could conceivably assess these experiences well enough from a public health perspective.

Notwithstanding these limitations, there are several strengths to this study. Few studies have examined factors for suicidal ideation in HIV-infected older adults, but this study focused on HIV-infected older adults aged 50 years and older. We analyzed several sociodemographic, HIV-related, health-related, and psychosocial characteristics to identify significant factors for suicidal ideation and used data from a city-wide representative sample. The findings will provide a basis for the development of nursing education programs for practitioners, including research for nursing intervention and policy development. Moreover, the findings could be used by HIV nursing consultants to identify HIV-infected older adults who are vulnerable to suicidal ideation.

## V. CONCLUSION

Psychosocial features, including unemployment, perceived belongingness, psychological functioning, and depression history, were associated with suicidal ideation among HIV-infected older

adults. This indicates a strong need to enhance psychosocial support for HIV-infected older adults. Therefore, comprehensive mental health services should be considered to provide coping resources for HIV-infected older adults who have suicidal ideation.

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ABSTRACT

## Psychosocial Features Affecting Suicidal Ideation Among Human Immunodeficiency Virus-infected Older Adults\*

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This cross-sectional design study was undertaken to determine the factors associated with suicidal ideation in human immunodeficiency virus (HIV)-infected older adults. Data from a city-wide representative sample collected by the Seoul Metropolitan Government were used. The cross-sectional survey was conducted between February and March 2013. Participants selected and included in the analysis were HIV-infected adults living in Seoul, and aged 50 years and older. The overall adjusted model showed that being unemployed (adjusted odds ratio [aOR], 3.34; 95% confidence interval [CI], 1.16-9.57), a history of depression treatment (aOR, 4.61; 95% CI, 1.02-20.66), perceived belongingness (aOR, 0.63; 95% CI, 0.41-0.99), and psychological functioning (aOR, 0.85; 95% CI, 0.73-0.99) were significantly related to suicidal ideation. Psychosocial features were found to be strongly associated with suicidal ideation among HIV-infected older adults. The findings could be useful for HIV nursing consultants to identify HIV-infected older adults who are vulnerable to suicidal ideation. Comprehensive mental health services should be provided as coping resources for HIV-infected older adults who have suicidal ideation.

**Key words** : Human immunodeficiency virus, Mental health, Suicide, Suicidal ideation, Aged

\* This study was supported by the BK21 four project (Center for Human-Caring Nurse Leaders for the Future) funded by the Ministry of Education (MOE, Korea) and National Research Foundation of Korea (NRF).