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Background: Advances in the treatment of HIV have resulted in a large growing population of older adults with HIV. These aging adults face added social, psychological, and physical challenges associated with managing the process of aging in addition to their HIV disease. Meanwhile, these factors can significantly impact quality of life. Though researchers have demonstrated correlations between depression, loneliness, health, and HIV/AIDS-related stigma, there has been little evaluation of these associations among HIV-positive adults over the age of 50.

Methods: Data for these analyses were taken from the *Research on Older Adults with HIV* (ROAH) study of 914 New York City-based HIV-positive men and women over the age of 50.

Results: In total, 39.1% of participants exhibited symptoms of major depression (CES-D > 23). Multivariate modeling successfully explained 42% of the variance in depression, with depression being significantly related to increased HIV-associated stigma, increased loneliness, decreased cognitive functioning, reduced levels of energy, and being younger.

Conclusion: These data underscore the need for service providers and researchers to assert more aggressive and innovative efforts to resolve both psychosocial and physical health issues that characterize the graying of the AIDS epidemic in the United States. Data suggest that focusing efforts to reduce HIV-related stigma and loneliness may have lasting effects in reducing major depressive symptoms and improving perceived health.

Learning Objectives:
Identify the prevalence of depression in HIV positive adults. Describe the association between loneliness, HIV-related stigma, and depression among older adults with HIV. Discuss the role of perceived health in major depressive symptoms among older adults with HIV.

Keywords: HIV/AIDS, Depression

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Table 1. *Sample characteristics, older adults living with HIV (N = 914)*

	n	%
Gender		
Male	640	70.0
Female	264	28.9
Transgender female (MTF)	7	0.8
Transgender male (FTM)	3	0.3
Race and ethnicity		
White	116	12.7
African American	455	49.8
Latino/a	299	32.7
Other	36	3.9
Missing	8	0.9
Sexual identity		
Heterosexual	577	63.1
Bisexual	74	8.1
Lesbian or gay	206	22.5
Other or missing	57	6.2
Living situation		
Alone	631	69.0
Partner	134	14.7
Relatives	80	8.8
Friends	33	3.6
Other or missing	36	3.9
Education		
< High school	195	21.3
High school graduate	270	29.5
Some college	248	27.1
College graduate	195	21.3
Missing	6	0.7

Table 1 (continued). *Sample characteristics, older adults living with HIV (N = 914)*

	n	%
AIDS diagnosis		
Yes	463	50.7
No	440	48.1
Missing	11	1.2
Drug use < 3 months		
Marijuana	205	22.4
Crack	139	15.2
Cocaine	133	14.6
Heroin	64	7.0
Mehtamphetamine	21	2.3
LSD	8	0.9
Ecstasy/MDMA	7	0.8
GHB	6	0.7
Ketamine	6	0.7
Any Illegal drug use < 3 months[a]		
Yes	314	34.4
No	546	59.7
Missing	54	5.9
Major depressive symptoms (within last seven days)		
Yes, CES-D total $\geq$ 23	357	39.1
No, CES-D total < 23	550	60.2
Missing	7	0.8

[a] Includes methamphetamine, cocaine, crack, heroin, ecstasy/MDMA, GHB, ketamine, LSD, or marijuana

Table 2. *Bivariate associations with major depressive symptomology among older adults living with HIV (N = 914)*

	n CES-D ≥ 23	% CES-D ≥ 23	χ^2	*df*	*p*
Sexual identity					
Heterosexual	233	40.7	4.78	1	0.03
Gay, lesbian, bisexual	92	33.0			
Gender[a]					
Male	250	39.2	0.02	1	0.88
Female	101	38.7			
Previous AIDS diagnosis					
Yes	176	38.3	0.06	1	0.81
No	171	39.1			
Race and ethnicity					
White	46	40.0	10.58	3	0.01
African American	156	34.5			
Latino/a	137	46.3			
Other	13	36.1			
Recent illegal drug use[b]					
Yes	133	40.3	2.96	1	0.09
No	181	34.5			

	Group 1, CES-D < 23	Group 2, CES-D ≥ 23			
	M (*SD*)	*M* (*SD*)	*t*	*df*	*p*
Continious measures					
Age	56.0 (4.98)	54.7 (4.54)	3.93	900	< .001
UCLA Loneliness Scale	40.1 (9.74)	49.8 (8.94)	-15.1	895	< .001
CD-4 count (square root transformed)	20.8 (6.49)	20.4 (6.45)	0.94	803	0.3473
Berger Stigma Scale	82.9 (20.2)	98.4 (22.6)	-10.7	895	< .001
Medical Outcomes Scale - HIV					
Physical function	68.0 (24.8)	56.6 (26.4)	6.61	903	< .001
Social function	77.9 (28.4)	61.6 (29.4)	8.17	874	< .001
Cognitive function	76.4 (21.3)	56.7 (21.9)	13.4	904	< .001
Pain	69.2 (25.0)	55.0 (25.7)	8.16	888	< .001
Energy/Fatigue	62.9 (17.6)	46.7 (17.6)	13.5	904	< .001

[a] Due to low cell counts transgender individuals (n = 10) were excluded from this test

[b] Includes methamphetamine, cocaine, crack, heroin, ecstasy/MDMA, GHB, ketamine, LSD, or marijuana

Table 3. *Correlation matrix of independent variables among older adults living with HIV (N = 914)*

	Female	GLB	Age	White	Latino	Physical Function	Social Function	Cognitive Function	Pain	Energy / Fatigue	Stigma	Loneliness	CD-4	AIDS Diagnosis
Female, 1 = yes	1.00	-0.24 ***	-0.04	-0.16 ***	0.02	-0.05	-0.01	-0.02	-0.01	0.03	-0.08 *	-0.14 ***	0.17 **	-0.10 **
Gay, lesbian, or bisexual, 1 = yes		1.00	0.06	0.37 ***	-0.01	0.15 ***	0.06	0.12 ***	0.00	-0.03	-0.11 **	0.01	-0.06	0.13 ***
Age			1.00	0.10 **	-0.07 *	-0.05	0.02	0.08 *	0.11 **	0.03	-0.06	-0.03	-0.02	-0.03
White, 1 = yes				1.00	-0.28 ***	0.09 *	0.07	0.04	-0.06	-0.12 **	0.01	0.08 *	-0.02	0.12 **
Latino, 1 = yes					1.00	-0.06	-0.03	-0.13 ***	-0.05	-0.05	0.06	0.06	-0.07	0.04
MOS-HIV Physical function						1.00	0.33 ***	0.23 ***	0.41 ***	0.40 ***	-0.09 *	-0.15 ***	0.00	-0.03
MOS-HIV Social function							1.00	0.32 ***	0.29 ***	0.32 ***	-0.23 ***	-0.22 ***	-0.01	-0.01
MOS-HIV Cognitive function								1.00	0.22 ***	0.37 ***	-0.27 ***	-0.31 ***	0.03	0.01
MOS-HIV Pain									1.00	0.52 ***	-0.23 ***	-0.25 ***	0.04	-0.13 ***
MOS-HIV Energy/Fatigue										1.00	-0.29 ***	-0.41 ***	0.08 *	-0.10 *
Berger Stigma scale total score											1.00	0.55 ***	0.00	-0.01
UCLA Loneliness scale total score												1.00	-0.05	0.05
CD-4 count (square root transformed)													1.00	-0.33 ***
Previous AIDS diagnosis, 1 = yes														1.00

Pearson r (2-tailed): * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4. *Logistic regression predicting major depressive symptomology (CES-D ≥ 23) among older adults living with HIV*

	Step 1				Step 2				Step 3			
	Demographics				Perceived Health				Stigma and Lonliness			
Model χ^2	26.3 ***				213.7 ***				276.8 ***			
df	5				10				12			
Nagelkerke R^2	0.05				0.34				0.42			
	β	AOR	95% CI	Sig.	β	AOR	95% CI	Sig.	β	AOR	95% CI	Sig.
Constant	2.46	11.70		*	6.89	982		***	1.99	7.32		
Female, 1 = yes	-0.20	0.82	0.58 -- 1.16		-0.17	0.84	0.57 -- 1.24		0.05	1.06	0.70 -- 1.60	
Gay, lesbian, or bisexual, 1 = yes	-0.56	0.57	0.39 -- 0.82	**	-0.46	0.63	0.42 -- 0.97	*	-0.39	0.68	0.44 -- 1.06	
Age	-0.05	0.95	0.92 -- 0.98	**	-0.05	0.95	0.92 -- 0.99	*	-0.05	0.96	0.92 -- 0.995	*
White, 1 = yes[a]	0.65	1.92	1.17 -- 3.15	**	0.34	1.40	0.77 -- 2.55		0.23	1.25	0.68 -- 2.33	
Latino, 1 = yes[a]	0.41	1.50	1.08 -- 2.10	*	0.14	1.15	0.78 -- 1.68		0.06	1.06	0.71 -- 1.59	
MOS-HIV Physical function					0.00	1.003	0.995 -- 1.01		0.00	1.00	0.99 -- 1.01	
MOS-HIV Social function					-0.01	0.99	0.99 -- 1.001		0.00	1.00	0.99 -- 1.004	
MOS-HIV Cognitive function					-0.03	0.97	0.96 -- 0.98	***	-0.03	0.98	0.966 -- 0.98	***
MOS-HIV Pain					-0.01	0.99	0.98 -- 0.999	*	-0.01	0.99	0.99 -- 1.001	
MOS-HIV Energy/Fatigue					-0.04	0.96	0.95 -- 0.98	***	-0.03	0.97	0.96 -- 0.986	***
Berger Stigma Scale total score									0.01	1.013	1.002 -- 1.02	*
UCLA Loneliness Scale total score									0.06	1.06	1.04 -- 1.09	***

AOR: Adjusted Odds Ratio. Sig: Significance

* $p < .05$, ** $p < .01$, *** $p < .001$

[a] Reference group is African Americans

Valid *n* (listwise) = 756