Looking at the Levels: Examining the Nuances of Tiered Antiretroviral Therapy (ART) Adherence among Women with HIV in Canada

Cathy Puskas[1], Neora Pick[2,3], Allison Carter[1,4], Lu Wang[1], Mona Loutfy[5,6], Alexandra de Pokomandy[7,8], Kathleen Webster[4], Rebecca Gormley[1,4], Angela Kaida[1], on behalf of the CHIWOS Research Team

1. British Columbia Centre for Excellence in HIV/AIDS, Vancouver, BC, Canada; 2. Oak Tree Clinic, BC Women's Hospital, Vancouver, BC, Canada; 3. Division of Infectious Diseases, Department of Medicine, University of British Columbia, Vancouver, BC, Canada; 4. Faculty of Health Sciences, Simon Fraser University, Burnaby, British Columbia, Canada; 5. Women's College Research Institute, Women's College Hospital, Toronto, Ontario, Canada; 6. Department of Medicine and Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Ontario, Canada; 7. Chronic Viral Illness Service, McGill University Health Centre, Montreal, Quebec, Canada; 8. Department of Family Medicine, McGill University, Montreal, Quebec, Canada

BACKGROUND

- Challenges to optimal ART adherence are gendered and affected by sociodemographic and psychosocial factors.
- Recognizing that women living with HIV (WLWH) are not a homogenous group, we measured ART adherence among women living with HIV using standard (≥95%) and tiered levels to explore associations with viral suppression and psychosocial correlates.
- This study identifies areas and services to support ART adherence among a diverse community of women living with HIV in Canada.

METHODS

- We analyzed survey data from the community-collaborative Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS) collected between August 2013 and May 2015.
- Among women reporting currently receiving ART, we measured self-reported ART adherence in the previous month (Walsh Visual Analog Scale) using two definitions of adherence: dichotomized (≥95% of pills taken versus <95%) and tiered (≥95%, 80-95%, 50-80%, and <50% of pills taken).
- Viral suppression was assessed as undetectable (<50 copies/mL) versus detectable via a validated self-reported measure.
- Multivariable models were developed using logistic regression (dichotomized adherence) and ordinal logistic regression (tiered adherence; sociodemographic and psychosocial models).

Table 1: Bivariate analysis of tiered adherence categories (n=1178).

Variable	≥95% Adherence (n=866) n (%) or Median (Q1-Q3)	80-95% Adherence (n=194) n (%) or Median (Q1-Q3)	50-80% Adherence (n=79) n (%) or Median (Q1-Q3)	<50% Adherence (n=39) n (%) or Median (Q1-Q3)	p-value
Age at interview	45 (37-52)	43 (36-50)	42 (36-49)	41 (32-48)	0.028
Ethnicity					0.003
Indigenous	151 (17%)	54 (28%)	20 (25%)	7 (18%)	
African/Caribbean/Black	271 (31%)	65 (34%)	21 (27%)	19 (49%)	
White	375 (43%)	65 (34%)	28 (35%)	11 (28%)	
Other	69 (8%)	10 (5%)	10 (13%)	2 (5%)	
Food Security					0.001
Secure	351 (41%)	66 (34%)	17 (22%)	10 (26%)	
Insecure	510 (59%)	127 (65%)	62 (78%)	29 (74%)	
Incarceration					<0.001
Never	571 (66%)	108 (56%)	37 (47%)	28 (72%)	
Not in past year	262 (30%)	64 (33%)	29 (37%)	7 (18%)	
Last year	32 (4%)	21 (11%)	12 (15%)	4 (10%)	
Injection Drug Use					0.036
Never	590 (68%)	117 (60%)	48 (61%)	29 (74%)	
Not currently	207 (24%)	55 (28%)	18 (23%)	6 (15%)	
Currently	54 (6%)	20 (10%)	11 (14%)	4 (10%)	
Perception of care from doctor as women-centred					0.067
Agree	486 (56%)	97 (50%)	34 (43%)	24 (62%)	
Neither agree nor disagree/ disagree	359 (41%)	92 (47%)	42 (53%)	14 (36%)	
Experienced Violence as an Adult					0.005
No	151 (17%)	18 (9%)	5 (6%)	4 (10%)	
Yes	658 (76%)	154 (79%)	70 (89%)	26 (67%)	
CES-D Depression Scale					0.006
No symptoms (<10)	447 (52%)	81 (42%)	29 (37%)	13 (33%)	
Symptoms (≥10)	390 (45%)	103 (53%)	42 (53%)	25 (64%)	
HIV Stigma Support	55 (40-68)	58 (43-73)	60 (50-80)	60 (45-75)	0.004
Personalized Stigma	18 (10-25)	18 (13-25)	23 (15-29)	20 (15-28)	0.041
Negative Self-Image	8 (0-15)	8 (5-18)	10 (8-20)	10 (5-20)	0.001
Resilience Scale	65 (60-69)	61 (56-66)	61 (57-65)	60 (54-67)	<0.001

Note: Responses "Don't know" and "Prefer not to answer" are not shown in this table, however they were included in analyses. Food security was based on a shortened CCHS Household Food Security Survey; food insecurity was defined as ever experiencing food insufficiency or lack of dietary diversity. Incarceration includes both provincial and/or federal incarceration. Experience of depressive symptoms was defined using the modified 10-item CES-D Depression Scale, with a score of 10 or higher indicating the presence of significant depressive symptoms. Personalized HIV-related stigma is the experienced stigma subscale of the Berger Stigma Scale, short form; higher scores indicate higher stigma. Negative self-image is the internalized stigma subscale of the Berger Stigma Scale, short form; higher scores indicate higher stigma. Resilience scale, 10-item scale with higher scores indicating higher resilience.

RESULTS

- Of 1178 women included, 73.5% reported ≥95% adherence, 16.5% reported 80-95%, 6.7% reported 50-80%, and 3.3% reported <50%. Higher adherence (dichotomized and tiered) was associated with viral suppression (p<0.001), however 89% of those reporting 80-95% adherence achieved viral suppression (not shown).
- Sociodemographic model of tiered adherence: food insecurity versus secure (adjusted odds ratio [AOR]: 0.73; 95% confidence interval [CI]: 0.54-0.97), incarceration within the past year versus never (AOR: 0.32; 95% CI: 0.19-0.55) were independently associated with lowered adherence.
- Psychosocial model of tiered adherence: violence experienced as an adult versus no (AOR: 0.53; 95% CI: 0.34-0.83), and negative self-image (AOR: 0.98; 95% CI: 0.96-1.00) were independently associated with lowered adherence, while high resilience scores were associated with higher adherence (AOR: 1.04; 95% CI: 1.02-1.06).
- A caveat to this trend was observed among women with adherence <50%, who often showed fewer markers of marginalization relative to the 50-80% adherence category.

Table 2: Multivariable analyses of variables associated with increased adherence (n=1178). Note: Sociodemographic and psychosocial models are discrete and separate models.

Variable	Univariable Analysis ≥95% versus lower adherence OR (95% CI)	p-value	Multivariable Analysis ≥95% versus lower adherence AOR (95% CI)	p-value
Sociodemographic Model				
Age at interview (per 1 year increase)	1.02 (1.01 to 1.03)	0.002	1.02 (1.01 to 1.03)	0.006
Ethnicity		0.005		0.059
Indigenous	Reference		Reference	
African/Caribbean/Black	1.32 (0.93 to 1.86)		0.93 (0.61 to 1.43)	
White	**1.85 (1.32 to 2.61)**		**1.46 (1.00 to 2.12)**	
Other	1.54 (0.90 to 2.64)		1.18 (0.66 to 2.12)	
Food Security		<0.001		0.033
Secure	Reference		Reference	
Insecure	**0.60 (0.46 to 0.79)**		0.73 (0.54 to 0.97)	
Incarceration		<0.001		<0.001
Never	Reference		Reference	
Not in past year	0.81 (0.61 to 1.08)		0.78 (0.55 to 1.11)	
Last year	**0.28 (0.18 to 0.46)**		**0.32 (0.19 to 0.55)**	
Injection Drug Use		0.013		
Never	Reference			
Not currently	0.90 (0.66 to 1.22)			
Currently	**0.52 (0.33 to 0.80)**			
Perception of care from doctor as women-centred				
Agree	Reference	0.066	Reference	0.084
Neither agree nor disagree/disagree	0.78 (0.60 to 1.02)		0.79 (0.60 to 1.03)	
Psychosocial Model				
Experienced Violence as an Adult				
No	Reference	0.001	Reference	0.006
Yes	**0.47 (0.31 to 0.73)**		**0.53 (0.34 to 0.83)**	
CES-D Depression Scale		0.001		
No symptoms (<10)	Reference			
Symptoms (≥10)	**0.62 (0.48 to 0.82)**			
HIV Stigma Support	**0.99 (0.98 to 1.00)**	<0.001		
Personalized Stigma	**0.98 (0.97 to 1.00)**	0.022		
Negative Self-Image	**0.97 (0.96 to 0.98)**	<0.001	**0.98 (0.96 to 1.00)**	0.031
Resilience Scale	**1.05 (1.03 to 1.06)**	<0.001	**1.04 (1.02 to 1.06)**	<0.001

OR, odds ratio; CI, confidence interval; AOR, adjusted odds ratio
Continuous variables report change in adherence relative to increase in respective scale.

DISCUSSION

- Analyses of tiered adherence allows a nuanced identification of gendered and social risk factors for non-maximal adherence among WLWH.
- Addressing marginalization, particularly in relation to food security, incarceration, and experienced violence, among WLWH may increase ART adherence.

Mina Kazemi (Ontario) Mina.kazemi@wchospital.ca

Rebecca Gormley (British Columbia) rgormley@cfenet.ubc.ca

Karène Proulx Boucher (Québec) chiwos.quebec@gmail.com

Conflict of Interest Disclosure: presenters have no conflict of interest.