Modifiable Factors Associated With Cardiovascular Disease Risk Among Women With and Without HIV

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BACKGROUND

- Cardiovascular disease (CVD) is the leading cause of morbidity and mortality among women in the United States.
- **Women living with HIV** (WWH) have **2x the risk of CVD** events compared to women without HIV (WWoH).
- While HIV-specific factors partially explain risk, interventions on modifiable factors may improve CVD outcomes.
- The objective of this study was to examine if **differences** exists among **modifiable risk factors for CVD** between WWH and WWoH.

METHODS

- We analyzed data from the Women's Interagency HIV Study (WIHS) to examine relationships between modifiable risks (e.g., **social support, psychological health, physical activity, diet quality, substance use, and HIV viral suppression**) and 10-year CVD risk scores among WWH and WWoH.
- Women were included if they were 30-79 years of age at the time of their semiannual WIHS study visit (April – September 2019) and had data to calculate the American College of Cardiology and American Heart Association **Pooled Cohort Risk Equation** (PCE).
- **Descriptive statistics** and **logistic regression** were used to test associations between each factor and CVD risk among WWH and WWoH
- **CVD risk was dichotomized** as low risk versus borderline or higher risk and **two-way interactions were tested by HIV-status.**
- **Odds ratios** [ORs] were not adjusted as age, race, and gender are included as part of the PCE.

RESULTS

- Data was available for 1,711 women
  - 72% living with HIV (86.3% virally suppressed)
  - 72.5% Black / 14.2% Hispanic / 9.6% White
  - Median age 53 years (IQR: 46-58)

Table 1. ASCVD Risk Scores

	Total n (%)	WWoH n (%)	WWH n (%)
ASCVD Risk Score, mean (IQR)	4.7 (1.7, 10.2)	5.1 (1.8, 11.6)	4.4 (1.7, 9.5)
Low Risk (<5%)	906 (53.0%)	234 (49.4%)	672 (54.3%)
Borderline Risk (5-7.4%)	226 (13.2%)	69 (14.6%)	157 (12.7%)
Intermediate Risk 7.5-19.9%)	418 (24.4%)	115 (24.3%)	303 (24.5%)
High Risk (≥ 20%)	161 (9.4%)	56 (11.8%)	105 (8.5%)
> Low Risk	906 (53.0%)	234 (49.4%)	672 (54.3%)

Smoking status is associated with higher risk for cardiovascular disease among women living with HIV compared to women without HIV.

MODIFICATION OF CVD RISK BY HIV STATUS

- 35.8% WWH and 38% WWoH reported smoking
- WWH who smoke have **2.54x** (95% CI [2.00, 3.21]) the odds of higher ASCVD risk than WWH who do not smoke.
- WWoH who smoke have **1.53x** (95% CI [1.06, 2.21]) the odds of higher ASCVD risk than WWoH who do not smoke.
- No effect modification by HIV-status was found for all other variables tested.

Higher annual household **income** (OR: 0.57, 95% confidence interval [CI]: 0.45-0.72), greater **physical activity** (OR: 0.63, 95% CI: 0.54-0.73), better **diet quality** (OR: 1.03, 95% CI: 1.00-1.06), and <7 **alcoholic drinks** per week (OR: 0.63, 95% CI: 0.51-0.77) were associated with decreased odds of higher CVD risk, while **current smoking** (OR: 2.22, 95% CI: 1.81-2.70) was associated with increased odds of higher CVD risk.



Table 2. Prevalence and Hazard Ratios of CVD Risk Factors

	Low Risk	> Low Risk	OR (95% CI) > Low Risk
Annual Household Income	n (%)	n (%)	
≤ $12,000 USD/year	405 (44.7)	426 (52.9)	1 (ref)
$12,001 - $24,000 USD/year	210 (23.2)	199 (24.7)	0.90 (0.71, 1.14)
≥ $24,000 USD/year	288 (31.8)	172 (21.4)	0.57 (0.45, 0.72)**
Education			
≤ Highschool	588 (64.9)	536 (66.6)	1 (ref)
> Highschool	318 (35.1)	269 (33.4)	0.93 (0.76, 1.13)
Smoking Status			
Not Currently Smoking	626 (69.1)	405 (50.3)	1 (ref)
Currently Smoking	280 (30.9)	400 (49.7)	2.21 (1.81, 2.70)**
Alcohol Use (drinks/week)			
Abstainer	427 (47.1)	468 (58.1)	1 (ref)
0 - 7	388 (42.8)	268 (33.3)	0.63 (0.51, 0.77)**
8 - 12	23 (2.5)	24 (3.0)	0.95 (0.53, 1.71)
> 12	68 (7.5)	45 (5.6)	0.60 (0.41, 0.90)*
Substance Use*			
No Current Use	835 (92.2)	736 (91.4)	1 (ref)
Current Use	71 (7.8)	69 (8.6)	1.10 (0.78, 1.56)
Poor Diet Quality, mean ± SD	37.7 ± 3.4	38.1 ± 3.4	1.30 (1.00, 1.06)*
Mild or Leisure Activity (hours/week)			
None Reported	-	-	1 (ref)
Reported hours/week, mean ± SD	0.9 ± 1.0	0.7 ± 1.0	0.85 (0.77, 0.94)*
Moderate or Strenuous Activity			
None Reported	-	-	1 (ref)
Reported hours/week, mean ± SD	0.5 ± 0.9	0.5 ± 0.6	0.63 (0.54, 0.73)**
Viral Load (Adherence)			
HIV RNA ≤ 200 copies/ml	578 (63.8)	504 (62.6)	1 (ref)
HIV - RNA>200 copies/ml	93 (10.3)	61 (7.6)	0.75 (0.53, 1.06)
Perceived Stress			
Low Stress	354 (39.1)	345 (42.9)	1 (ref)
Moderate or High Stress	412 (45.5)	373 (46.3)	0.93 (0.76, 1.14)
Depressive Symptoms			
CES-D ≤ 16	625 (69.0)	566 (70.3)	1 (ref)
CES-D > 16	281 (31.0)	239 (29.7)	0.94 (0.76, 1.16)
Emotional Social Support, mean ± SD	4.0 ± 1.1	3.9 ± 1.0	0.99 (0.91, 1.09)
Functional Social Support, mean ± SD	3.9 ± 1.2	3.9 ± 1.2	1.05 (0.97, 1.13)

Note. *p<.05. **p<.0001

CONCLUSION

- Interventions targeting modifiable lifestyle factors should be considered as a means to reduce CVD risk and improve outcomes among WWH and sociodemographically matched women without HIV
- Smoking cessation interventions may be particularly beneficial for women living with HIV to help improve cardiovascular outcomes and mitigate health inequities.

ACKNOWLEDGEMENTS

- This study was conducted through the MWCCS which is primarily funded by the National Heart, Lung, and Blood Institute
- This study would not have been possible without the dedication, time, and effort of WIHS study participants.