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

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program abstract

Background: Cardiovascular disease (CVD) is the leading cause of morbidity and mortality among women in the United States. Women living with HIV
(WWH) have twice the risk of CVD events compared to women without HIV
(WWoH). While increased CVD risk for WWH has been largely attributed to HIV-specific factors, interventions on modifiable factors (e.g., social support, psychological health, physical activity, diet quality, substance use, and HIV viral suppression) may decrease CVD risk among women.
Methods: We analyzed data from the Women's Interagency HIV Study (WIHS) to examine relationships between individual-level factors and CVD risk 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), a 10-year CVD risk score. 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% HIV+) with a **median age of 53 years** (IQR: 46-58). Approximately half (53%) were classified as having low (<5%) risk, **while 13%, 24%, and 9% were classified as having borderline (5-7.4%), moderate (7.5-19.9%), or high risk (≥ 20%), respectively**. **45.7% of WWH and 51.6% of WWoH were classified as having borderline or higher risk for CVD**.

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. We found effect modification of smoking by HIV status, with an OR for higher risk of

2.54 (95% CI: 2.00-3.21) among WWH versus 1.53 (95% CI:1.07-2.21) among WWoH. There was a lack of modification by HIV-status for all other variables tested.

Conclusion: Interventions targeting modifiable lifestyle factors should be considered as a means to reduce CVD risk and improve outcomes among WWH and women behaviorally at risk for acquiring HIV.

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.

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%)

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.

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.

| Physical Activity | Diet Quality | Alcohol Use | Smoking Status |

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

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)
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