Differences in Severity & Correlates of Depression between Men and Women Living with HIV in Ontario, Canada

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Background

In Men and Women living with HIV:

- Gender plays an important role in the diagnosis of depression:
  - **Higher Prevalence in Women:** In the 15-site cross section study, CRANium, researchers found that a higher proportion of women with HIV than men with HIV met criteria for depression (17.9% versus 14.3%, p=0.01).¹
  - **More Depressive Symptoms in Women:** Women have reported more depressive symptoms than men.²


- Gender differences of the correlates of depressive symptoms in men and women living with HIV have not been well characterized.
  - **Previous identified correlates include:** Stigma, homelessness, active drug use, low socioeconomic variables, younger age, and advanced HIV disease stage.
Objectives

- **Primary objective:** To determine the proportion, severity and distribution of depression in women living with HIV as compared to men with HIV.

- **Secondary objective:** Identify demographic, social, and psychological correlates associated with depression in men and women living with HIV, and to examine gender differences in these correlates.
Methods

Our Study

- A cross sectional analysis
- Used data the prospective Observational Study by Ontario HIV Treatment Network (OHTN) Cohort Study (OCS) of people living with HIV who 1) > 16, 2) consent, and 3) reside & are in care in Ontario
  - includes an interview-administered 90-minute questionnaire

Study Participants

- Inclusion criteria:
  - Data collected on Gender
  - Completed the Center for Epidemiologic Studies Depression Scale (CES-D) with > 50% completed
  - 1275 (96%) patients had completely filled out all the CES-D questions. Of the 52 who had less than complete data, 85% of those had only 1 or 2 missing items. CES-D was imputed for people missing <50% of the CES-D question (means imputed)
Methods + Measurements

Centre for Epidemiologic Studies Depression Scale

- Screening instrument for depressive symptoms with significant use in practice demonstrating strong psychometric properties
- Has been used in community-based and clinical samples in men and women with HIV
- High internal consistency, test–retest reliability, concurrent and construct validity in HIV
- Item scores are added together to generate a summary score ranging from 0 to 60 (20 questions ranging from 0 to 3 each):
  - Higher scores signify higher depressive symptoms
  - Scores >15: significant depressive symptoms
  - Scores >21: categorized as severe depressive symptoms

Primary Correlate of Interest

- Gender
  - Gender: Social, economic, political and cultural forces that define feminine vs. masculine role.

Other correlates that previous studies associated w/ depression were examined:

1) Demographic correlates (e.g. age, race, immigrant status)¹
2) Clinical correlates (e.g. viral load, CD4 cell count, length of HIV diagnosis)²
3) Stigma (revised version of the HIV Stigma Scale Berger and colleagues)³
4) Stressors (e.g. recent life events, early childhood adversities)⁴

³ Sergio Rueda, Mastery Moderates the Negative Effect of Stigma on Depressive Symptoms in People Living with HIV. AIDS Behav (2012) 16:690–699.
Statistical Analysis

Demographic, clinical and social characteristics summarized by gender:
- Median/interquartile ranges (continuous variables)
- Frequencies/percentages (categorical variables)

Social Characteristics compared by gender:
- Wilcoxon rank sum tests (continuous variables)
- Chi-square tests/Fisher’s exact tests (categorical variables)

Quantile regression models:
- Described the effect of gender on quantiles of depression scores (10th, 25th, 50th, 75th, 90th) rather than mean (as with linear regression)
  - Useful when the effect of gender may change the shape of the distribution
  - Examined gender differences at the upper end of CES-D: Participants most at risk for depression
- Univariate and multivariable quantile regression models estimated the association between total depression scores and gender
Results

Study Population

- Transgender, Transsexual or inter-sexed participants were excluded because small sample size and ethical issues of disclosure (n=8).
- 1331 participants completed CES-D
- 1327 met the inclusion criteria (267 women and 1060 men) (1 did not answer any CES-D questions. The remaining 3 filled out less than <50%).

Clinical Characteristics

- On antiretroviral therapy: 81% of men vs. 88% of women (p=0.02)
- CD4+(cells/mm3) ≥500: 43% of male and 43% female participants.
- CD4+(cells/mm3) <200: 10% men vs. 12% women (p=0.52)
- Undetectable viral loads: 75% of men vs. 68% of women (p=0.02)

Men

- More likely to be: Older; White; Born in Canada; Gay/bisexual.
- More likely to have longer duration of HIV infection and antiretroviral treatment.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men</th>
<th>Women</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>48 years</td>
<td>41 years</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>White</td>
<td>68%</td>
<td>34%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Born in Canada</td>
<td>63%</td>
<td>29%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Gay/Bisexual</td>
<td>81%</td>
<td>5%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Duration HIV Diagnosis</td>
<td>12 years</td>
<td>8 years</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Duration of ARV Therapy</td>
<td>9 years</td>
<td>5 years</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Women

- More likely to be: Black, from a country with high HIV prevalence, from a household income <40k/year, less educated.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men</th>
<th>Women</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>13%</td>
<td>57%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Endemic Country Origin</td>
<td>10%</td>
<td>59%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Household income &lt;40k/year</td>
<td>47%</td>
<td>67%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>High school education or less</td>
<td>30%</td>
<td>42%</td>
<td>&lt;0.0001</td>
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</tbody>
</table>
Results: Normogram of CES-D Scores: Women vs. Men

- Women had higher CES-D scores vs. men (median, IQR): 13 [5-26] vs. 9 [3-20], p = 0.0004.
- Women were more likely to have total CES-D scores >15 (44% vs. 33%, p = 0.002) and >21 (31% vs. 23%, p = 0.003).

- 10th percentile of scores: No difference in distribution (0 [95% CL -1.0 – 1.0])
- 75th percentile of scores: Women’s score was 6 points higher than that of men (95% CL 2.0 – 10.0).
Multivariable correlates of Depression (Outcome = total CES-D scores at 50th Quantile)

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>P value</th>
<th>Men</th>
<th>P value</th>
<th>Women &amp; Men</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEMOGRAPHICS</strong></td>
<td></td>
<td></td>
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<tr>
<td>Women</td>
<td>-3.4(-6.0,-0.8)</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Age‡</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>&lt;40</td>
<td>-0.2(-0.5,0.2)</td>
<td>0.33</td>
<td>0.1(-0.1,0.3)</td>
<td>0.20</td>
<td>0.1(-0.1,0.3)</td>
<td>0.26</td>
</tr>
<tr>
<td>≥40</td>
<td>0.3(0.0,0.7)</td>
<td>0.03</td>
<td>-0.0(-0.1,0.1)</td>
<td>0.89</td>
<td>0.0(-0.1,0.1)</td>
<td>0.90</td>
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<tr>
<td>Women * Age</td>
<td></td>
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<tr>
<td>&lt;40, per year</td>
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<tr>
<td>≥40, per year</td>
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<tr>
<td>ARV</td>
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<tr>
<td>Current EFV</td>
<td>-1.2(-2.4,-0.1)</td>
<td>0.04</td>
<td>-1.3(-2.3,-0.2)</td>
<td>0.02</td>
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<tr>
<td>IDU</td>
<td>9.9(-0.6,19.6)</td>
<td>0.06</td>
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<tr>
<td><strong>SOCIAL FACTORS</strong></td>
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<tr>
<td>Employment Status</td>
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<tr>
<td>Disability</td>
<td>7.4(4.2,10.6)</td>
<td>&lt;.0001</td>
<td>4.3(2.3,6.4)</td>
<td>&lt;.0001</td>
<td>5.4(3.7,7.0)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1.1(-2.5,4.8)</td>
<td>0.53</td>
<td>3.4(1.1,5.7)</td>
<td>0.003</td>
<td>3.0(1.4,4.6)</td>
<td>0.0002</td>
</tr>
<tr>
<td>Retired/Volunteering/Student</td>
<td>-2.5(-6.3,1.2)</td>
<td>0.19</td>
<td>0.5(-1.2,2.2)</td>
<td>0.54</td>
<td>-0.1(-1.4,1.2)</td>
<td>0.90</td>
</tr>
<tr>
<td>Employed FT/PT (reference)</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PSYCHOLOGIC FACTORS</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total Stigma Score&lt;50</td>
<td>-0.2(-0.5,0.1)</td>
<td>0.31</td>
<td>0.0(-0.0,0.1)</td>
<td>0.32</td>
<td>0.0(-0.1,0.1)</td>
<td>0.68</td>
</tr>
<tr>
<td>Total Stigma Score≥50</td>
<td>0.5(0.3,0.7)</td>
<td>&lt;.0001</td>
<td>0.5(0.3,0.7)</td>
<td>&lt;.0001</td>
<td>0.5(0.3,0.7)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recent Life Events</td>
<td>1.5(0.3,2.8)</td>
<td>0.01</td>
<td>1.5(0.63,2.3)</td>
<td>0.0008</td>
<td>1.3(0.6,2.0)</td>
<td>0.0005</td>
</tr>
<tr>
<td>Early Childhood Events</td>
<td>0.2(-0.8,1.1)</td>
<td>0.74</td>
<td>1.1(0.5,1.7)</td>
<td>0.0002</td>
<td>0.9(0.4,1.4)</td>
<td>0.0002</td>
</tr>
<tr>
<td>Ongoing Problems</td>
<td>1.5(0.7,2.4)</td>
<td>0.0004</td>
<td>1.5(1.1,1.49)</td>
<td>&lt;.0001</td>
<td>1.4(1.1,1.8)</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>
Results: Age and Depression Scores (Multivariate Analysis)

Women ≥40 increased median depression (0.4 per increased year, p = 0.005)
Stigma And Depression Scores

Stigma: In both men and women, scores ≥50 were associated with higher median CES-D scores.
Women & men with HIV had high levels of depression but women > men (31% vs. 23% scores > 21).
Correlates of depression were mostly similar between men and women with HIV including disability, overall stigma scores ≥50, and greater recent life and ongoing stressors.
However there were some differences including IDU and age ≥40 for women and being unemployed an early childhood stressors in men.
Gender differences on the distribution of depression scores across varying quantiles, with women showing higher depression scores at 75th quantile.

There exist gender differences in the experience of depression amongst men and women living with HIV beyond that of severity in symptoms.

1) Cross-sectional design, recruitment bias, fewer women (n=267)
2) Assessed depression symptoms, not depressive disorders
3) Did not examine significance of depression and gender among diverse racial populations; did not include Trans people
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