Interpersonal Predictors of Depression Trajectories in Women with HIV

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Depression in Women with HIV

- Elevated symptoms of depression are common among women with HIV
  - Annual prevalence rate = 20%-60% $^{1,2}$
  - vs.
  - Annual prevalence in general population = 5-15%
  - Annual prevalence in women = 10-20%
Depression in Women with HIV

- Depression in general is a major public health issue
  - Most common mental illness
  - Estimated to cost over $43 billion annually
  - Prospectively linked to major causes of death (e.g., smoking, diet, alcohol, accidents)

- However, there are three reasons for particular concern about the high rate of depression among women with HIV
Depression in Women with HIV

1. Heightened depression is associated with difficulty adhering to antiretrovirals\(^1,2\)
   - Women in general show less adherence; depressed women be especially prone to non-adherence\(^3\)
   - Poor adherence leads to to greater health complications and earlier death\(^4\)
   - Poor adherence may also contribute to the production of new HIV strains that are resistant to medication\(^3\)

Depression in Women with HIV

2. Presence of depressive symptoms may hasten the lymphocyte cell decline that occurs in HIV

- Chronic depression is associated with accelerated CD4 count decline and mortality in women, even when differences in medication are controlled\textsuperscript{1,2,3}
- Treatment of depression may improve lymphocyte cell functioning\textsuperscript{4}
- Such findings are consistent with psychoneuroimmunology research indicating depression can alter human lymphocyte cell functioning\textsuperscript{5,6}

Depression in Women with HIV

3. Depressive symptoms among women with HIV may contribute to high-risk sexual behavior

- Crepaz & Marks (2001) meta-analysis showing no link between depression and risky sexual behavior
  BUT mostly male samples

- Studies of women with HIV suggest heightened depression is predictive of unprotected sexual intercourse and subsequent STDs

- Women with HIV and depression less likely to disclose status to partners

Depression in Women with HIV

Together, these findings suggest reducing depressive symptoms could contribute to:

- better medication adherence
- improved health
- reduction in risky sexual behavior
Depression in Women with HIV

- Several cross-sectional studies have examined the prevalence and correlates of depression in HIV+ women.
- However, few studies have focused on identifying predictors of the course of symptoms over time.
- This line of inquiry is essential because:
  - factors associated with the occurrence of a mental disorder ≠ factors that predict the course of the disorder.
  - developing empirically based treatments requires knowledge of factors associated with the course (i.e., remission or worsening) of symptoms over time.
Models of Depression

- Many theoretical models about cause of depression; three models most relevant to understanding the course of symptoms:

<table>
<thead>
<tr>
<th>VIEW</th>
<th>TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological</td>
<td>Medication</td>
</tr>
<tr>
<td>Cognitive</td>
<td>Cognitive-Behavioral Therapy (CBT)</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Interpersonal Therapy (IPT)</td>
</tr>
</tbody>
</table>
IPT Approach to Depression

From **IPT** approach, maintenance of depression is conceptualized as resulting from problems in four specific areas:

1. Bereavement
2. Transitions or difficulty in important social roles
3. Interpersonal deficits leading to social isolation
4. Relationship conflict
IPT Approach to Depression

- **Bereavement**
  - Women with HIV report high levels of interpersonal losses\(^1,2\)
  - May be especially affected by such deaths because of implications for their own mortality\(^3\)

- **Social role difficulty**
  - Serious illness affects various roles, but for women has strong impact on caregiving role
  - Majority of women with HIV are mothers and indicate this is their most important social role\(^4,5\)
  - Disease contributes to concerns about caregiving abilities and future of children, difficulty performing some parental responsibilities\(^6,7\)

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1. Sikkema et al., 2000  
2. Fiore et al., 2000  
3. Reed, Kemeny, Taylor, & Visscher, 1999  
4. Schuseter et al., 1999  
5. Sandelowski & Barroso, 2003  
7. Ingram & Hutchinson, 1999
IPT Approach to Depression

- **Social isolation**
  - HIV is a stigmatizing disease worldwide
  - Most women with HIV report significant social isolation\(^1\)
  - Women with HIV often less connected than men to HIV-related services that may provide social support\(^2\)

- **Relationship conflict**
  - 1/2 women with HIV report partner violence in adult life; ¼ report in the last year\(^3,4\)
  - ½ the women with HIV who reported violence from partner indicate recent event was related to disease\(^5\)

Purpose of current study

- Interpersonal factors that are believed to increase or maintain depressive symptoms over time (bereavement, maternal role difficulty, social isolation, partner conflict) are often present in the lives of women with HIV.

- Guided by IPT models of depression, the current study examines how these four interpersonal factors influence the naturalistic course of depressive symptoms in women with HIV.
  - over 5 year period
  - using longitudinal methods appropriate for the study of change
Participants and procedures

- Participants = 761 women participating in HIV Epidemiological Research Study (HERS)
- Women HIV+ but not meeting AIDS criteria at study start
- From four sites (Baltimore, Bronx, Providence RI, Detroit)
- Recruitment conducted from 1993-1995 and follow up visits completed by 2001
- Women recruited through medical clinics, social service agencies, drug treatment, public announcements, etc.
- Every six months women interviewed and underwent physical examinations and specimen collection
- Women with less than 3 visits excluded for current analyses
- Of a possible 10 visits, average number of visits was 7.42 (SD=2.5; Range 3-10)
Measures

- Depression = CES-D (Radloff, 1977) is a widely used 20-item scale designed to assess major components of depression. Respondents rate the frequency of each symptom over the last 7 days. Because CES-D can inflate depression in medical populations, the cognitive affective component was used for analysis (15 items, alpha = .86)
Measures

- Five main types of depressive symptoms
  - Emotional (feeling sad, crying spells, anhedonia)
  - Motivational (unable to initiate activities, apathy)
  - Cognitive (pessimism, sense of worthlessness, trouble concentrating)
  - Behavioral (poor hygiene, slowed physical response)
  - Physiological (disturbances in appetite, sleeping)
Interpersonal Measures

- **Bereavement** = Number of deaths of significant others in last 6 months
- **Maternal role difficulty** = Nine items with 1-5 response scale assessing frequency of concerns about caregiving abilities and the effect of HIV on children (alpha = .84)
- **HIV-related social isolation** = 13 yes/no items assessing perceived isolation from family and friends attributed to HIV diagnosis (alpha = .87)
- **Relationship conflict with partner** = 8 items about conflict with main partner or partner seen most in last 6 months. Items assess frequency of verbal quarrels, insults, violence, rejection associated with HIV (alpha = .78)
Measures

- **Clinical control variables**
  - CD4 count
  - Antiretroviral medication
  - HIV-related physical symptoms (e.g. fever, diarrhea)
  - Antidepressant medication
  - Recent drug use (IV and crack/cocaine)

- **Sociodemographic control variables**
  - Age
  - Race/ethnicity
  - SES Risk = Composite of four indicators of disadvantage (no HS degree, unemployed, receiving public assistance, monthly income <1000$)
Focus on predicting change:

- SEM approach to growth curve modeling used to examine the impact of initial interpersonal factors on depressive symptom trajectories over five year period.

- Cross-lag models in SEM were used to test the effect of interpersonal characteristics on depression over one year intervals (i.e. model in which both independent variables and dependent variables free to vary).
Growth Curve Modeling
Growth curve modeling

- Depression Trajectory Intercept
- Depression Trajectory Slope

Time 1: Depression
Time 2: Depression
Time 3: Depression
Time 4: Depression
Time 5: Depression

E1, E2, E3, E4, E5
SEM Approach to Cross-Lag Modeling

Tested as a nested model in which parameters labeled “a” were free to vary in default model and constrained to equal 0 in alternative model.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>%</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td>35.47 (6.73)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Latina/Hispanic</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic disadvantage indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income &lt; $1000/month</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>Receiving public assistance</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>83%</td>
<td></td>
</tr>
<tr>
<td>No HS degree</td>
<td>45%</td>
<td></td>
</tr>
</tbody>
</table>
## Baseline Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>%</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed antidepressant during study</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>CD4 cell count at baseline</td>
<td></td>
<td>444.53 (269.75)</td>
</tr>
<tr>
<td>&lt;200</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>200-500</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>&gt;500</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Antiretroviral use during study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 66% of visits</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>33-65% of visits</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>1-32% of visits</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Drug use in past 6 months</td>
<td>35%</td>
<td></td>
</tr>
</tbody>
</table>
## Baseline Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>%</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bereavement (Range 0-6)</td>
<td></td>
<td>1.40 (1.20)</td>
</tr>
<tr>
<td>Maternal role difficulty (range 1-5)</td>
<td>2.16 (.94)</td>
<td></td>
</tr>
<tr>
<td>Social isolation (Range 0-8)</td>
<td></td>
<td>2.05 (1.06)</td>
</tr>
<tr>
<td>Partner conflict (Range 1-4)</td>
<td></td>
<td>1.74 (.57)</td>
</tr>
<tr>
<td>Baseline CES-D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total score &gt; 16</td>
<td>58%</td>
<td>24.5 (9.7)</td>
</tr>
<tr>
<td>Cognitive affective score &gt; 16</td>
<td>44%</td>
<td>18.5 (6.9)</td>
</tr>
</tbody>
</table>
Depression scores over time for total sample

- CES-D Cognitive Affective Score
- CES-D Depression Total Score
Depression symptom trajectory for sample

Intercept mean = 18.59**
Intercept variance = 22.52***

Slope = -.21**, Slope variance = 11.18***
Results

Depression Trajectory Intercept

Bereavement
Maternal Role Difficulty
HIV-related Isolation
Partner Conflict

Depression Trajectory Slope
(controlling for baseline depression)

Depression T1
Depression T2
Depression T3
Depression T4
Depression T5
Depression T6
Depression T7
Depression T8
Depression T9
Depression T10
Results

- Bereavement
- Maternal Role Difficulty
- HIV-Related Isolation
- Partner Conflict

Depression Trajectory
  - Intercept
  - Slope
Results from final growth curve model

Significant control variables in final multivariate model include HIV-related symptoms, recent drug use, and antidepressant use.
Results from final growth curve model

Bereavement
Maternal Role Difficulty
HIV-Related Isolation
Partner Conflict

Depression Trajectory Intercept

Depression Trajectory Slope

Total $R^2 = .09$; $\Delta R^2 = .05$

Significant control variables in final multivariate model include age, SES risk, and antidepressant use
Depression Trajectory for Sample

Depression

CES-D Cognitive Affective Score

Time
Depression Trajectories for Women with Different Levels of Partner Conflict

- Low Initial Depression/ Low Partner Conflict (n=210)
- Low Initial Depression/ High Partner Conflict (n=102)
- High Initial Depression/ Low Partner Conflict (n=143)
- High Initial Depression/ High Partner Conflict (n=176)
Results from cross-lag model

- Next set of analyses used cross-lag models in a nested design to look at effect of interpersonal factors on change in depression over one-year periods
- Both IVs and DVs free to vary in this approach
- Significant differential chi-square value suggests effect of specific interpersonal factor is statistically significant
SEM Approach to Cross-Lag Modeling

Interpersonal Predictor Y1 → Depression Y1
Interpersonal Predictor Y2 → Depression Y2
Interpersonal Predictor Y3 → Depression Y3
Interpersonal Predictor Y4 → Depression Y4
Interpersonal Predictor Y5 → Depression Y5

Depression Y1 → Interpersonal Predictor Y2
Depression Y2 → Interpersonal Predictor Y3
Depression Y3 → Interpersonal Predictor Y4
Depression Y4 → Interpersonal Predictor Y5

Tested as a nested model in which parameters labeled “a” were free to vary in default model and constrained to equal 0 in alternative model.
## Results from cross-lag models

<table>
<thead>
<tr>
<th>Interpersonal Predictor</th>
<th>Nested model comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bereavement</td>
<td>$\chi^2$ differential = 0.01, $df=1$, $p=.90$</td>
</tr>
<tr>
<td>Maternal role difficulty</td>
<td>$\chi^2$ differential = 0.89, $df=1$, $p=.34$</td>
</tr>
<tr>
<td>HIV-Related Social Isolation</td>
<td>$\chi^2$ differential = 1.38, $df=1$, $p=.24$</td>
</tr>
<tr>
<td><strong>Partner Conflict</strong></td>
<td>$\chi^2$ differential = 3.97, $df=1$, $p&lt;.05$</td>
</tr>
</tbody>
</table>
Results from cross-lag models

Partner Conflict Y1 → Partner Conflict Y2 → Partner Conflict Y3 → Partner Conflict Y4 → Partner Conflict Y5
Depression Y1 → Depression Y2 → Depression Y3 → Depression Y4 → Depression Y5

Overall, model provided good fit to the data
(\chi^2 = 47.76, df=28, GFI=.99, AGFI=.98, RMSEA=.03)
A post-hoc nested model test of the reverse cross-lag relation between partner conflict and depression (i.e., with depression predicting subsequent increases in partner conflict) was nonsignificant ($\chi^2$ differential = 2.04, $df=1, p=.15$).
Summary of Findings

- Maternal role difficulty, HIV-related social isolation, and partner conflict additively contributed to higher levels of initial depression.
- Only partner conflict predicted change in depressive symptoms over both extended time periods and relative short time periods.
- Increased partner conflict was associated with maintenance of high symptoms among those initially depressed, and an increase in symptoms among those initially not depressed.
- No evidence was found of bi-directional effects (i.e., depression leading to more partner conflict).
Conflict in intimate relationships has been consistently linked to depression among women in general\(^1\).

Quality of romantic relationships may be particularly influential on women’s mental health because women have different standards for this relationship:

- relative to other relationships\(^2\)
- and relative to men\(^3\)

HIV, Partner Conflict, and Depression

- Less is known about the interplay between partner conflict, depression, and HIV status
- The impact of partner conflict on mental health may be stronger in women with HIV than without HIV\(^1\)
- Partner conflict may have a particularly strong impact on mental health in women with HIV because
  - Disease may increase dependence within relationships\(^2\)
  - HIV can alter the nature of partnerships (e.g., sexuality, blame or support in concordant couples)
  - Positive HIV status may lead some women to remain in a conflictual relationship because they believe the disease limits options for alternative partners

1. Jones et al., 2003; 2. Hader et al., 2001
Clinical Implications

- Findings highlight the potential utility of:
  - Therapies focusing on current relational issues, particularly the quality of intimate relationships\(^1,2\)
  - Incorporating topics such as conflict resolution, communication skills, or anger management into therapy modalities often used to treat depression
  - Using dyadic approaches for women in long-term relationships
  - Offering relationship focused programs in settings other than mental health facilities for prevention
  - Developing empirically supported interventions delivered in medical settings

1. Markowitz et al., 1998; 2. Schneiderman et al., 2001
Study Limitations

- Reliance on self-report
  - Overestimates of prevalence
  - Underestimates of undesirable behaviors
- Focus on only specific interpersonal factors
- Study began before the advent of HAART
- By design, women in this sample were HIV+ plus other risk factors; 1/3 of new cases of women with HIV have no identified risk factors
Conclusions

- Women with HIV have multiple stressors and often experience heightened depression.
- Results highlight the potential benefit of interventions that focus on interpersonal issues and partnerships.
- However, treatment outcome research is needed to determine effectiveness in changing depression and more distal health behaviors.
- Depression among women with HIV has implications for individual and public health; developing and evaluating treatment programs tailored to the needs of these women should be a priority.
Acknowledgements

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