Do Anger Expressions, Coping Strategies and Interpersonal Support Dynamics Relate to CD4 Count in HIV+ Adults?

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What is a CD4 Cell?

- The best predictor of immune function decline for people living with HIV (PLH) is CD4 T-helper cell count (Kelly, 1992); as CD4 count decreases, disease symptoms increase.

- Healthy immune function is salient for people living with HIV (PLH) and has been studied vigorously over the past few decades (Weeks & Alcamo, 2010).
Anger Expressions, Coping Strategies and Interpersonal Support Dynamics

- Anger suppression is related to negative mental health outcomes for PLH (Daniel, Goldston, Erkanle, Franklin, Mayfield, 2009); therefore, finding alternative ways to express anger is critical for mental health professionals.

- Active coping is a commonly accepted method to ameliorate negative consequences of anger (Lohr, Olatunji, Baumeister, & Bushman, 2007) possibly via social support systems.

- Social support is related to less self reported HIV-related health symptoms over time (Ashton et al., 2005).
Social Cognitive Theory
Bandura (1976)

Person
(Anger expressions)

Behavior
(Active coping)

Environment
(Social support)
Hypotheses

1) Anger expressions are positively associated with CD4 count.

2) Tangible social support is positively associated with CD4 count.

3) Active coping is positively associated with CD4 count.

4) Anger Expression, tangible social support and active coping account for a significant proportion of variance in CD4 T-helper cell count.
Participants

- Participants with HIV were recruited from the Dallas / Fort Worth area.
  - 18 years or older
  - Fluent in English

- Participants signed informed consent forms for our Institutional Review Board (IRB) approved study.

- We used computer-based questionnaires.

- Participants were provided an incentive of $25 upon completion of the questionnaire.
## Demographics

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>32</td>
<td>50.0%</td>
</tr>
<tr>
<td>Male</td>
<td>32</td>
<td>50.0%</td>
</tr>
<tr>
<td><strong>Ethnicity:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>43</td>
<td>67.3%</td>
</tr>
<tr>
<td>European American</td>
<td>17</td>
<td>26.7%</td>
</tr>
<tr>
<td>Latino</td>
<td>2</td>
<td>3.0%</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>3.0%</td>
</tr>
<tr>
<td><strong>Sexual Orientation:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>31</td>
<td>48.4%</td>
</tr>
<tr>
<td>Gay</td>
<td>24</td>
<td>37.5%</td>
</tr>
<tr>
<td>Bisexual</td>
<td>9</td>
<td>14.1%</td>
</tr>
</tbody>
</table>

### Mean, Standard Deviation, Range

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>47</td>
<td>9.0</td>
<td>29-66</td>
</tr>
<tr>
<td>Years of education</td>
<td>12</td>
<td>2.7</td>
<td>3-18</td>
</tr>
</tbody>
</table>
Methodology

- Univariate & bivariate analyses
- Cross-sectional correlational design
- Hierarchical Linear Regression analysis

Dependent variable: CD4 cell Count

Independent variables: Anger Expression, Social Support, Active Coping
Measures

- **Anger:** State-Trait Anger Expression Inventory (STAXI)
  - Cronbach’s α = 0.72-.89 & Construct validity
    (Buss & Perry, 1992)
    “When I get frustrated, I feel like hitting someone”

- **Social Support:** Interpersonal Support Evaluation List (ISEL)
  (Cohen et al., 1985).
  - Cronbach’s α = 0.77-.86 & Convergent validity with Socially Supportive Behaviors (ISSB; Cohen & Hoberman, 1983).
    “When I need suggestions on how to deal with a personal problem, I know who to turn to.”

- **Coping:** Brief Cope (Carver, 1997)
  - Cronbach’s α = 0.50-.90 & Construct validity (Carver, 1997)
    “I’ve been taking action to try to make the situation better.”

- **CD4 Count:** CD4 count was self-reported from the participants’ last medical assessment.
# Data Analysis: Univariate

<table>
<thead>
<tr>
<th>Univariate</th>
<th>M (SD)</th>
<th>Possible range</th>
<th>Actual range</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger expressions</td>
<td>6.2 (2.0)</td>
<td>5-15</td>
<td>5-15</td>
<td>.86</td>
</tr>
<tr>
<td>Tangible Social Support</td>
<td>10.3 (1.6)</td>
<td>4-16</td>
<td>4-16</td>
<td>.82</td>
</tr>
<tr>
<td>Active Coping</td>
<td>6.8 (1.7)</td>
<td>2-8</td>
<td>2-8</td>
<td>.80</td>
</tr>
<tr>
<td>CD4 Count</td>
<td>572 (341)</td>
<td>58-2000</td>
<td>0-2000</td>
<td>-</td>
</tr>
</tbody>
</table>
## Data Analysis: Bivariate

<table>
<thead>
<tr>
<th>Correlation Table</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Age</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.Years of education</td>
<td>.19</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3.Anger expressions</td>
<td>-.25*</td>
<td>-.11</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4.Active coping</td>
<td>.00</td>
<td>.07</td>
<td>-.18</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5.Tangible Social Support</td>
<td>.04</td>
<td>-.08</td>
<td>.09</td>
<td>.10</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>6.CD4 Count</td>
<td>.27*</td>
<td>.15</td>
<td>.20*</td>
<td>.34**</td>
<td>.20*</td>
<td>1</td>
</tr>
</tbody>
</table>

Note:*p<.05 **p<.01
Data Analysis: Multivariate

- Dependent Variable: CD4 Count.
- Variables were entered simultaneously.
- We controlled for Age, Gender & When the last CD4 count assessment was taken.

<table>
<thead>
<tr>
<th>Multivariate</th>
<th>β</th>
<th>t</th>
<th>p&lt;</th>
<th>Tolerance</th>
<th>VIF</th>
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</thead>
<tbody>
<tr>
<td>Anger Expression</td>
<td>.22</td>
<td>2.04</td>
<td>.05</td>
<td>.90</td>
<td>1.11</td>
</tr>
<tr>
<td>Active Coping</td>
<td>.42</td>
<td>3.98</td>
<td>.001</td>
<td>.95</td>
<td>1.06</td>
</tr>
<tr>
<td>Tangible Social Support</td>
<td>.29</td>
<td>2.66</td>
<td>.01</td>
<td>.85</td>
<td>1.18</td>
</tr>
</tbody>
</table>

(Adj. R²=.33, F(6,57)= 6.12, p<.001)
Discussion

1) Anger expressions, are positively associated with CD4 count: Supported

2) Tangible social support is positively associated with CD4 count: Supported

3) Active coping is positively associated with CD4 count: Supported

4) Anger Expression, tangible social support and active coping account for a significant amount of variance in CD4 T-helper cell count: Supported

**Conclusion:** Our goal to elucidate the relationships between anger expression, social support and active coping on CD4 count has been completed.
Clinical Implications: Results from our study support the creation of a social support intervention intended to allow PLH to express anger actively in order to reduce the rate of CD4 decline. Hopefully, a social support intervention may reduce negative health symptoms for PLH (Ashton et al., 2005).

Through such social support interventions, active coping could ameliorate negative consequences of anger (Lohr, Olatunji, Baumeister, & Bushman, 2007) and perhaps reduce CD4 decline.

By working with clients on anger expression and active coping, psychological health may be increased as well (Ashton et al., 2005).
Discussion Continued…

Limitations: Our cross-sectional correlation design inhibited our ability to infer causal relationships.

Self-report style scales and CD4 count used are vulnerable to participants giving socially desirable answers.

Lastly, our convenience sample is not representative of the entire HIV-positive population; a random sample would be more inclusive.

Future research: Medical assessments of CD4 count could be used to eliminate socially desirable responses. Future studies could include control and experimental groups to discern differences between groups for the variables of interest.
Acknowledgements

- Center for Psychosocial Health Research
  - Members & Faculty
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Questions
References


