Social Networks & HIV Medical Adherence:
Implications to structural interventions

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Overview

• Rationale of research program

• Networks as structured social environments
  – A link between macrosocial structures (eg, SES) & health

• Findings on support networks & gender differences in HIV medical adherence

• Implications to structural approaches to intervention
Rationale

• Optimal HIV management necessitates lifelong, near absolute adherence to HIV treatment (HAART)

• Suboptimal adherence risks development of drug resistant HIV strains

• Current intervention approaches
  – Atheoretical or individual-focused theories of behavior (eg. cognitive behavioral)
  – Clinic based
  – Emphasis on knowledge, attitudes, self-efficacy, etc
  – Limited efficacy or sustainability of behavior change
  – Devoid of attention to social, economic, cultural context
Premise: More effective & sustainable approach to behavior change

• Introduce new social norms and routines that are culturally consistent with the population

• To do that, first need to understand…
  – How the community engages in the behavior?
  – Who in individuals’ social environments are key influences on the behavior?
    • Negative (promote risk)
    • Positive (promote resiliency)
  – How can we improve the effectiveness of prosocial behaviors? sustain positive behavioral influences?
Social support & adherence

- Social support is one of the most consistent predictors of medical adherence, including for HIV (Di Matteo, 2004)

- Social support conceptualizations
  - In epidemiology & biomedical literatures, affective (cognitive or personality) definitions emphasized (Coyle)
    - Sense of being loved, belonging
  - In sociology & anthropology literatures, interactional (behavioral) definitions emphasized
    - Valued resources that are socially exchanged (Bourdieu, 1983)
      - Emotional, informational, instrumental, financial support
    - Structural functional approach

- Social capital
  - Social networks or channels through which individuals access valued resources (Bourdieu, 1983)
    - affection, information, time, money
Medical adherence is most consistently associated with interactive (instrumental) forms of social support (Di Matteo, 2004).

Suggests that the people available to help individuals and the things they do for them matter to their health.

Among disadvantaged populations, social support & social capital are vital to health--- and survival (Stack, 1974; Vaux, 1989; Hobfoll).
HAART & disadvantaged African Americans

- Racial/ethnic disparities in HAART use & health outcomes (Moore, 2004)
  - Delayed & inconsistent medical care & tx; more rapid HIV progression

- Low income African Americans provide more informal care vs other SES/racial groups, including for HIV (Turner, 1994)
  - Historical context of exclusion/exploitation by institutionalized medicine
  - Community resiliency
Support networks operationalized

• Delineate support network members by main forms of support
  – Emotional (confide or listen)
  – Financial (who could you borrow money from)
  – Instrumental (time and energy, household chores)
  – Informational (health advice)
  – Socialization (have fun with)

• Characteristics of network members, eg, demographics, drug use, conflict, social roles
Support network factors associated with outpatient clinic use among disadvantaged HIV+s (Baltimore; AOR's; n=395)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Outpatient service use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted Odds Ratios</td>
</tr>
<tr>
<td>Current drug use</td>
<td>0.58 *</td>
</tr>
<tr>
<td>Gender: female</td>
<td>1.52</td>
</tr>
<tr>
<td>AIDS diagnosis</td>
<td>2.58 *</td>
</tr>
<tr>
<td>Health insurance</td>
<td>1.53</td>
</tr>
<tr>
<td><strong>No. in Emotional Support NW</strong></td>
<td>1.23 *</td>
</tr>
<tr>
<td><strong>No. Females in NW</strong></td>
<td>1.24 *</td>
</tr>
</tbody>
</table>

Knowlton, et al 2005
# Predictors of successful HAART over 1-year among disadvantaged HIV+s

*(INSPIRE Study; n=154)*

<table>
<thead>
<tr>
<th>Baseline Variables</th>
<th>AOR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Informal care</strong></td>
<td>4.60**</td>
<td>1.21, 17.53</td>
</tr>
<tr>
<td>(Instrumental or emotional support)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Live alone</strong></td>
<td>0.26**</td>
<td>0.07, 0.99</td>
</tr>
<tr>
<td><strong>Social comfort taking HIV medications: high</strong></td>
<td>3.47**</td>
<td>1.00, 11.99</td>
</tr>
<tr>
<td><strong>Cocaine use, prior 3 months</strong></td>
<td>2.43</td>
<td>0.55, 10.78</td>
</tr>
<tr>
<td><strong>CD4 count &gt;350</strong></td>
<td>4.54**</td>
<td>1.46, 14.11</td>
</tr>
</tbody>
</table>

Knowlton et al., 2007
Most behavior is not a result of conscious decision making, rather social norms and routines (Goffman, 1961)

Norms: Rules and procedures that facilitate adaptation to a particular social environment

Transmitted through social interactions, allow the reproduction of social institutions, eg, family, marriage (Giddens, 1984)

Conservative influences on behavior
- Strong negative reactions from network members for deviating from norms
- Complying with them is socially rewarded
Changing norms

• Difficult to change, but once adopted, new norms tend to be perpetuated
  – Process of negotiation
  – Often advantageous to introduce new behaviors into relevant, salient social roles
    • Culturally consistent approach to behavior change

• Socially focused interventions
  – Small groups: networks, dyads
  – Structured discussion to introduce, practice and socially reinforce new behaviors
    • Role modeling, social affirmation
  – NOT the same as self-help (support) groups
Costs of support

Implications to intervention
Reciprocity (support exchange) a fundamental social norm (Levi-Strauss, 1964)
- Golden Rule (treat others as you want to be treated)
- Evolutionary value

Predictive of mental & physical health outcomes
- Receipt of social support enhances mental health status when offered in mutually supportive relationships (Chandola, 2007)
- Conversely, low reciprocity in main ties predicts depression, alcohol dependence, Type 2 diabetes, and CVD risks (Siegrist, 2005)
Social capital & HAART adherence in SS Africa

• HAART adherence rates are higher in some disadvantaged African communities than in N. America (Mills, 2006)
  – Counter to expectations
  – Low knowledge, literacy, health care infrastructure, etc.

• Possible explanations
  – Selection bias, temporal effects, etc
  – Social roles, i.e., informal caregiving
    • Family & friends provide vast majority of care to chronically & terminally ill
    • Caregiving defined as
      – Instrumental assistance (eg, personal care) & emotional support
      – Social role, eg, spouse/main partner, family
  – Part of process of preserving social capital among HIV+’s (Ware, et al., 2009)
Social capital & HAART adherence in Uganda

• Adherence as reciprocity of support to preserve social capital (Ware, et al., 2009)

• Mutual obligation within supportive relationships
  – Patients “beg and borrow” to eat, access meds
  – Family & friends care for HIV+’s & facilitate treatment
    • Expectation that HIV+’s health will improve, so they won’t continue to be a burden
  – HIV+’s risk social alienation, rejection if their health does not improve
Reciprocity norms

- Vary by role relation
  - Kin vs. non-kin: eg, delayed vs. more immediate reciprocity
  - Gender (roles)

- Violating norms of reciprocity (or only receiving support in a relationship) is proposed to elicit feelings of dependence, indebtedness, or inferiority, which leads to stress reactions that adversely impact health. (Chandola, 2007)
  - Those who report lower reciprocity in their main ties have greater levels of biologic markers of stress. (Siegrist, 2005)
U.S. gender disparities in HAART

• U.S. women vs men have low HAART use & worse HIV health outcomes (Gebo, 2005)

• Findings are not explained by gender differences in treatment efficacy
  – In W Europe & sS Africa, women vs men tend to have better HAART outcomes

• Could there be differences in US HIV+ women’s vs men’s
  – SES
  – Populations infected (eg, drug abusing, race/ethnicity), or
  – Social environments?
## Women: HAART adherence correlated with main partner status

(ARK Study, Baltimore; n=104)

<table>
<thead>
<tr>
<th>Main Partner Status</th>
<th>Adherent in prior week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has no main partner</td>
<td>92 %</td>
</tr>
<tr>
<td>Has HIV- or UNK status main partner</td>
<td>76 %</td>
</tr>
<tr>
<td>Has HIV+ partner</td>
<td>57 %</td>
</tr>
</tbody>
</table>

MH Chi-square, p=.004

Source: Knowlton et al. (in press). AIDS Care.
Adj odds of HAART adherence among **women** (ARK study, Baltimore, 2003-05; n = 104).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Adj ORs</th>
<th>95% CI’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education: $\geq 12^{th}$ grade</td>
<td>1.81</td>
<td>0.55, 6.02</td>
</tr>
<tr>
<td>Attitudes toward HAART: positive</td>
<td>1.39 *</td>
<td>1.12, 1.72</td>
</tr>
<tr>
<td>Cognitive impairment: high</td>
<td>0.17 *</td>
<td>0.04, 0.74</td>
</tr>
<tr>
<td><strong>Has an HIV+ main partner</strong> #</td>
<td>**0.25 ***</td>
<td><strong>0.07, 0.94</strong></td>
</tr>
<tr>
<td>Emotional support from sex partner: yes</td>
<td>0.12 *</td>
<td>0.03, 0.49</td>
</tr>
</tbody>
</table>

* p<.05
Potential explanations of findings on women’s adherence

- Findings were not explained by differences in partner conflict, closeness, or individual-level characteristics
  - HIV+ partners were more likely to live with them, assist them and be preferred as HIV supporters

- HIV+ partners’ care was ineffective

- Women’s caregiving or household management obligations

- Consistent with literature indicating women vs men gain less health benefits of marriage/main partner (Kiecolt-Glaser)
Men’s HAART adherence

- Research question
  - What social factors are associated with adherence among HIV+, disadvantaged, African American men?
Adj odds of HAART adherence among **men** (ARK study, Baltimore, 2003-05; n = 154).

<table>
<thead>
<tr>
<th></th>
<th>Adj ORs</th>
<th>95% CIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current illicit drug use #</td>
<td>0.61</td>
<td>0.21, 1.79</td>
</tr>
<tr>
<td>Favorable attitudes about HAART</td>
<td>1.08</td>
<td>0.91, 1.28</td>
</tr>
<tr>
<td>Comfortable taking HAART around close friends</td>
<td>2.90 *</td>
<td>1.03, 8.17</td>
</tr>
<tr>
<td>Has informal care: yes</td>
<td>0.83</td>
<td>0.14, 4.87</td>
</tr>
<tr>
<td>Reciprocity of support: high</td>
<td>0.20</td>
<td>0.02, 1.73</td>
</tr>
<tr>
<td>Reciprocity of support X Has informal care</td>
<td>12.14 *</td>
<td>1.06, 138.87</td>
</tr>
</tbody>
</table>

* p<.05
Conclusions on gender differences findings

• For women, main partners are highly relied on for support & are preferred sources of care
  – Yet having a main partner (especially HIV+) interferes with adherence

• For men, informal care promotes adherence, but contingent on men’s reciprocity of support
Informal caregiver factors as correlates of depression among HIV+ African Americans
(SHORE Study; Pseudo R²=.52)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Adjusted odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index’s current drug use</td>
<td>2.62 *</td>
</tr>
<tr>
<td>Caregiver’s depressive symptoms (CES-D≥16)</td>
<td>3.59 **</td>
</tr>
<tr>
<td>Caregiver-index communication</td>
<td>0.76 **</td>
</tr>
<tr>
<td><strong>Index’s financial reliance on caregiver</strong></td>
<td>2.99 *</td>
</tr>
<tr>
<td>Caregiver-index role relation (sibling or friend)</td>
<td>3.09 **</td>
</tr>
</tbody>
</table>

** p<.01; * p<.05

Source: Knowlton, et al., 2009
Support obligations & poverty

• Obligations to assist network members impedes low income communities from rising out of poverty
  – Large networks are adaptive to a point
  – Networks of vulnerability

• In such contexts, choice of breaking social ties to amass wealth, or remaining in perpetual poverty
  – Flight of middle class African Americans to county
  – Concentration of poverty in inner cities
  – In Africa, countrysides of women and children
Implications to adherence intervention

• Appropriate targets of intervention?

• How to enable & sustain
  – Informal care provision
  – Informal care receipt?

• Gender-specific intervention?

• Role relation (partner vs friend) specific?
  – Introduce new behaviors, support exchange norms