Effects of Integrated Community-Based Care and Group Microfinance on Antiretroviral Therapy Adherence Among Adults Living with HIV in Western Kenya

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• No conflicts of interest to report
Background

• In 2017, Kenya approved a single-pill anti-retroviral (ART) regimen containing dolutegravir
  • Less side effects → easier to adhere to → higher barrier to viral resistance
  • High ART adherence required for successful viral suppression
• In 2020, an estimated 81% of persons living with HIV (PLHIV) achieved viral suppression in Kenya
  • Poor retention in HIV Care
  • Retention ensures access to ARTs, clinical monitoring, and disease management
Interventions to Improve HIV Care Retention in SSA

**Community-Based Care**

- Decentralized clinical care
- Alleviates transportation barriers
- Direct patient delivery of clinical services and medicines

**Group Microfinance**

- Economic-strengthening via access to informal banking
- Opportunities for health education
- “Group Effect”
Harambee Study

• Recently completed two-arm cluster randomized trial
  • Randomization at the level of microfinance groups (n=57 groups)
• Arm A: Delivery of community-based integrated HIV/NCD care during regular microfinance group meetings (MF + ICB)
• Arm B: Microfinance group participants with facility-based care (MF + SOC)
• Arm C: Facility-based care participants matched to microfinance group members (SOC)
Data Sources

• Harambee study data:
  • Participant-level demographic data and covariates
  • ART refill data through dispensing records during ICB care visits (MF + ICB)

• Local facility dispensing records:
  • ART refill data through facility-based electronic and paper medical records (MF + SOC)

• AMPATH medical records:
  • ART refill data through AMPATH electronic medical records (SOC)
Objectives and Hypothesis

• **Objective:**
  To evaluate the effects of integrated community-based care and group microfinance participation on pharmacy-reported ART adherence in a cluster randomized control trial.

• **Hypothesis:**
  MF + ICB participants will demonstrate more significant improvements in ART adherence over 18 months than MF + SOC and SOC participants.
# Participant-Level Covariates

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Patient reported or from the medical record</td>
</tr>
<tr>
<td>Education Status</td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
</tr>
<tr>
<td>Food Security</td>
<td>Household Food Insecurity Access Scale</td>
</tr>
<tr>
<td>Internalized HIV Sigma</td>
<td>HIV Felt Stigma Questionnaire</td>
</tr>
<tr>
<td>Social Support</td>
<td>OSLO Social Support Scale</td>
</tr>
</tbody>
</table>
Outcome Measures

• Medication Possession Ratio (MPR):

\[ MPR = \frac{\text{Sum of day's supply for all fills in period}}{\text{Number of days in period}} \]

• Time-interval-based measures: Baseline (0 – 6 months), Mid-Intervention (>6 - 12 months), Late-Intervention (>12 – 18 months)

<table>
<thead>
<tr>
<th>MPR</th>
<th>Clinical Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;0.94</td>
<td>Optimal</td>
</tr>
<tr>
<td>0.80 – 0.94</td>
<td>Suboptimal</td>
</tr>
<tr>
<td>&lt;0.80</td>
<td>Poor</td>
</tr>
</tbody>
</table>
Pharmacy-Reported ART Adherence Results

The effects of group MF with and without ICB care, compared to SOC alone, on pharmacy-reported adherence. Unadjusted Treatment-by-Time Model:

<table>
<thead>
<tr>
<th>Model Term</th>
<th>Beta Estimate</th>
<th>Std. Error</th>
<th>T-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF + ICB vs SOC</td>
<td>0.048</td>
<td>0.008</td>
<td>5.678</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>MF + SOC vs SOC</td>
<td>0.057</td>
<td>0.007</td>
<td>7.191</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>MF + ICB vs MF + SOC</td>
<td>-0.008</td>
<td>0.012</td>
<td>-0.741</td>
<td>0.459</td>
</tr>
</tbody>
</table>

Table Notes: Post-time indicates the post-treatment period. Medication Possession Ratio (MPR); Antiretroviral Therapy (ART); Integrated community-based care (ICB); Microfinance (MF)
Harambee Study: Viral Suppression

• Compared to SOC, viral suppression increased over 18 months among:
  • MF + ICB care participants (OR: 2.16, 95% CI [1.48, 3.19], p< 0.001)
  • MF + SOC participants (OR: 1.42, 95% CI [1.05, 1.92], p= 0.023)
• No significant difference was observed in MF + SOC and MF + ICB participants

Conclusions

• ART adherence may act as a surrogate measure for HIV care retention
• Group microfinance participation may increase ART adherence
  • Group effects
  • ART adherence education
• Integrating community-based care into group microfinance could improve ART adherence
Limitations

1) MPR is not a perfect measure of adherence or ART effectiveness
   • MPR >0.94 is associated with improved viral suppression and increased clinical outcomes in PLHIV in SSA

2) Missing MPR data during the late-intervention period was observed among patients with higher reported HIV stigma

3) Generalizability of results
   • Harambee Study recruited patients involved in HIV care for a substantial amount of time with access to AMPATH services
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Analytical Approach: Difference-in-Differences

\[ ART_{it} = \beta_{1it}(Arm) + \beta_{1it}(Arm) \times Postt + \beta_{3t} + \beta_{4i} + \epsilon_{it} \]

<table>
<thead>
<tr>
<th>Equation</th>
<th>( \beta_{1it}(Arm) )</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>ICB Care (Arm A)</td>
<td>SOC (Arm C)</td>
</tr>
<tr>
<td>#2</td>
<td>MF (Arm B)</td>
<td>SOC (Arm C)</td>
</tr>
<tr>
<td>#3</td>
<td>ICB Care (Arm A)</td>
<td>MF (Arm B)</td>
</tr>
</tbody>
</table>