The Effect of a Community-based Multifaceted Behavioral Intervention in Korean Americans with Type 2 Diabetes (SHIP-DM)

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Funding Sources

• Funding Sources
  – NIDDK (R18DK083936).
  – LifScan provides study devices (OneTouch® glucometer, OneTouch® UltraSoft® test strips & OneTouch® UltraSoft® lancets).

• Clinical Trial Registration
  – clinicaltrials.gov identifier NCT0126479
Type 2 diabetes mellitus is a serious health problem in Asian-American communities, including the Korean Americans (KAs).

Today’s Korean Americans (KAs)
- have low literacy levels
- experience a scarcity of personal and community resources
- face institutional and cultural barriers
Objective

- The project tested a community-based, culturally tailored, multifaceted behavioral intervention program designed for Korean Americans (KAs) with type 2 diabetes on critical behavioral and clinical outcomes.

Specific Aims

- Enroll 250 Korean Americans with type 2 diabetes in a clinical trial comparing a comprehensive community-based RN/CHW behavioral intervention to usual care to reduce HbA1c levels over 12 months.
Methods

- **Design:** Open Label Randomized Clinical Trial
- **Setting:** Baltimore Washington metropolitan area
- **Period:** September 2010 – June 2013
- Community partner, The Korean Resource Center (KRC), in charge of recruitment, enrollment, retention of participants, and active engagement in interventions.
- Intervention has three components
  1) 12-hour group education sessions
  2) Home blood sugar monitoring for 12 months
  3) Monthly telephone coaching session using motivational counselling method
Methods

Integrated Theoretical Framework

- Self-Help Model
- Community-based Participatory Research Framework
- The PRECEDE-PROCEDE
ANTECEDENTS

Predisposing Factors
- Individual characteristics
- Acculturation status
- Cultural beliefs/attitudes
- Severity of disease
- Depression

Enabling Factors
- Health literacy
- DM knowledge
- DM related self-efficacy
- Accessibility to care

Reinforcing Factors
- Family/peer support
- Community support

OUTCOMES

Predisposing Factors
- Glucose control ↑
- BP control ↑
- Total cholesterol control ↑

Psycho-Behavioral Outcomes
- DM knowledge ↑
- Self-care skills ↑
- QOL ↑

Community Outcomes
- Community readiness/awareness about diabetes
- Culturally tailored, literacy-focused DM management protocol
- Readily transferable education materials to other communities
- Community empowerment for self-care for DM control

INTERVENTIONS

Culturally Tailored Behavioral Education Program
- Classroom education with culturally sensitive materials
- Health literacy tailored education

Ongoing Home Glucose Monitoring
- Tele-transmission of home glucose monitoring
- Individually tailored monitoring reports to promote patient-provider communication
- Telephone reminders of follow-up appointment

Individualized Case Management via Telephone Counseling
- Individually tailored behavioral counseling via phone
- Guidance for optimal utilization of healthcare
- Referrals to community resources for care as needed

CBPR Process
- Active engagement with community collaborators in all phases of the study
- Empowering community-Supervision, consultation, feedback by community advisory board
- Expanding community infrastructure by using coalitions
- Direct Communication to patients, families, & the target KA community to sustain established infrastructure
- Developing dissemination strategies with community partners
Eligibility Criteria

• The first generation of Korean American immigrant
• Physician diagnosis Type 2 DM
• Age 35 years or older
• Difficulty of managing glucose level as demonstrated by HbA1c at 7.0 or above
• Able to stay in the program for at least a year.
Randomization (n=250)

**Integrate Care Group (ICG) (n=120)**
1) 6 weeks in-class training (12 hours)
2) Home glucose monitoring
3) Monthly telephone counseling

**Usual Care Group (UCG) (n=130)**
- Delayed intervention after month 12
Interventions

**INTERVENTIONS**

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DM knowledge ↑
Problem solving ↑
Confidence ↑
Self-care skills ↑
Confidence ↑
Problem solving ↑
Positive cognitive reframing ↑
• Culturally-tailored protocol:
  – Acknowledging cultural myths about each component of the behavioral intervention
  – Crafting intervention messages based on relevant cultural philosophy or values
  – Adapting the most popular cultural practices to reinforce the behavioral modifications
**Intervention 2**

**Ongoing Home Glucose Monitoring**

**INTERVENTIONS**

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*Evidence-based DM-specific behavioral intervention components*
- Power of self-monitoring and documenting in chronic disease management as a tool to enhance self-efficacy and promote adherence to treatment recommendations, and ultimately treatment outcomes
Intervention 3
Individualized Case Management via Telephone Counseling

**INTERVENTIONS**

**Culturally Tailored Behavioral Education Program**
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**Evidence-based DM-specific behavioral intervention components**
- Mobilization of social support by interacting with trained bilingual nurse counselor

- Problem solving ↑
- Positive cognitive reframing ↑
### Sample Characteristics at Baseline (n=250)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Total</th>
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<tbody>
<tr>
<td>Age, years (SD)</td>
<td>58.9 (8.44)</td>
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<tr>
<td>Male, n (%)</td>
<td>142 (56.8%)</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>108 (43.2%)</td>
</tr>
<tr>
<td>Married, n (%)</td>
<td>224 (89.6%)</td>
</tr>
<tr>
<td>Family size, persons (SD)</td>
<td>3.0 (1.22)</td>
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<tr>
<td>Working: full/part time (%)</td>
<td>148 (59.7%)</td>
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<tr>
<td>Years in USA (SD)</td>
<td>23.7 (11.1)</td>
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<td>Education, years (SD)</td>
<td>13.3 (3.22)</td>
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<tr>
<td>Housing own, n(%)</td>
<td>160 (64.0%)</td>
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<tr>
<td>Comfortable living/OK, (%)</td>
<td>169 (68.1%)</td>
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<tr>
<td>Monthly income, $(SD)</td>
<td>$4,269 ($7,379)</td>
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</table>
Proximal outcome (1)

**Diabetes self-efficacy (8-80) \( (\alpha = .86) \)**

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Month 3</th>
<th>Month 6</th>
<th>Month 12</th>
<th>Total (M0-12)</th>
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<tbody>
<tr>
<td>diff(ICG-UCG)</td>
<td>2.6</td>
<td>10.8</td>
<td>11.0</td>
<td>12.0</td>
<td>8.9</td>
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<td>( P(</td>
<td>\text{diff}</td>
<td>) )</td>
<td>.179</td>
<td>.000</td>
<td>.000</td>
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**Usual Care Group (UCG) \( (n=130) \)**

**Integrate Care Group (ICG) \( (n=120) \)**
Proximal outcome (2)

**Diabetes knowledge (0-14) \( (\alpha = .82) \)**

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Month 3</th>
<th>Month 6</th>
<th>Month 12</th>
<th>Total (M0-12)</th>
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</thead>
<tbody>
<tr>
<td>diff(ICG-UCG)</td>
<td>-0.36</td>
<td>1.63</td>
<td>1.34</td>
<td>1.84</td>
<td>1.09</td>
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<tr>
<td>( P(</td>
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<td>) )</td>
<td>.348</td>
<td>.000</td>
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Proximal outcome (3)

**Attitudes toward diabetes (10-50) \( (\alpha = .80) \)**

<table>
<thead>
<tr>
<th>diff(ICG-UCG)</th>
<th>Baseline</th>
<th>Month 3</th>
<th>Month 6</th>
<th>Month 12</th>
<th>Total (M0-12)</th>
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<tbody>
<tr>
<td>-.20</td>
<td>.07</td>
<td>.06</td>
<td>.19</td>
<td>.072</td>
<td>.936</td>
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<tr>
<td>P(</td>
<td>diff</td>
<td>)</td>
<td>.037</td>
<td>.435</td>
<td>.515</td>
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DM Quality of Life (1-5) \((\alpha = .8407)\)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
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<th>Month 6</th>
<th>Month 12</th>
<th>Total (M0-12)</th>
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</thead>
<tbody>
<tr>
<td>diff(ICG-UCG)</td>
<td>-0.06</td>
<td>0.18</td>
<td>0.21</td>
<td>0.27</td>
<td>0.14</td>
</tr>
<tr>
<td>P(</td>
<td>diff</td>
<td>)</td>
<td>.429</td>
<td>.014</td>
<td>.017</td>
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</tbody>
</table>

Usual Care Group (UCG) (n=130)

Integrate Care Group (ICG) (n=120)
Proximal outcome (5)

**Depression-PRQ9 (0-27) (α = .87)**

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Month 3</th>
<th>Month 6</th>
<th>Month 12</th>
<th>Total (M0-12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>diff(ICG-UCG)</td>
<td>0.34</td>
<td>-1.02</td>
<td>0.08</td>
<td>-0.75</td>
<td>-0.33</td>
</tr>
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<td>P(</td>
<td>diff</td>
<td>)</td>
<td>.585</td>
<td>.081</td>
<td>.899</td>
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</tbody>
</table>

Usual Care Group (UCG) (n=130)
Integrate Care Group (ICG) (n=120)
Distal outcomes

### Glucose (mg/dL)

- **Usual Care Group (UCG) (n=130)**
- **Integrate Care Group (ICG) (n=120)**

### Hemoglobin A1c

### LDL Cholesterol (mg/dL)

### Total Cholesterol (mg/dL)
Distal outcome

Hemoglobin A1c

Usual Care Group (UCG) (n=130)

Integrate Care Group (ICG) (n=120)
During the 12 month project period:
- ICG sustained 1.0%-1.3% reductions of HbA1c, while UCG maintained 0.3%-0.6% reductions.

Statistically significant improvement of self-efficacy and quality of life in IG was observed when compared to the UCG.
Conclusions

- Community-based interventions provided by healthcare providers (e.g., RNs/CHWs) seem to be effective in helping people manage their chronic conditions in natural settings.
Implications

• This study has the potential to be a sustainable model practice in the community.

• A combination of physician extenders-running MCO and RN/CHWs running community wellness centers may be an answer to ascertain both higher quality standards and cost-containment for the management and control of chronic diseases in general and diabetes in particular.
Thank You!