Cancer Prevention: Nutrition and Physical Activity Outcomes of a Group Randomized Trial of an Internet-Based Intervention in Churches.

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Center for Research in Health Behavior, Department of Psychology
General Aims: Public Health Sciences

- High fidelity theory based intervention
- Produce meaningful outcomes related to Healthy People 2010 goals and objectives
- Contribute to theory
Specific AIMS

- **Nutrition (FFQ)**
  - F & V servings/day
  - Whole Grain Servings g/day
  - Fat – Percent kcal

- **Physical Activity (Pedometer & Log)**
  - Steps/day
  - Minutes in planned walking/day

- **Prevention of Weight Gain (Weight)**

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Conceptualization

- **Social Cognitive Theory**
  - 4th generation intervention; embedded in supportive social networks

- **Church – based**
  - naturally existing social supports
  - congregation based prompts and goals and feedback
  - comfortable field setting for research component
    - recruitment, assessments, computer skills training
  - access moderately large groups

- **Computer/Internet-based delivery**
  - fidelity of intervention
  - self-paced progression through programs
  - individual tailoring based on initial behavior
  - reach large groups for little extra cost

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Church-Based GTH

- 12 modules
- interactive, highly visual
- narrator (takes on the qualities of a guide)
- weekly introduction of new content
  - physical activity
  - nutrition
  - energy balance (weight gain prevention)
- weekly self-monitoring and reporting
  - daily steps walked
  - target food intake

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Effectiveness Test

- GTH-alone vs. GTH + enhanced self-regulation vs. Control-waiting
- Stratified random assignment after baseline
  - denomination, size, & predominant race of congregation
- Assessment clinics at churches
  - baseline
    - $20 + $5/week of grocery receipts (up to $30)
  - post 1 at 7 months
    - $30.00+ $5/week of grocery receipts (up to $30)
  - post 2 at 12 months
    - $40.00+ $5/week of grocery receipts (up to $30)

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Step Program

- Gradual goal setting
  - through program interactions
  - adoption of strategies to increase adherence
  - daily step goal (baseline + 500 steps/week)
  - daily tracking of steps
Each week I’ll ask you to increase the average number of steps you take each day by 500. As a start point we’ve taken an average using the step counts you reported on the step log you kept for us last Fall.

<table>
<thead>
<tr>
<th>Steps Reported</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1: 2000</td>
<td></td>
</tr>
<tr>
<td>Day 2: 4500</td>
<td></td>
</tr>
<tr>
<td>Day 3: 3500</td>
<td></td>
</tr>
<tr>
<td>Day 4: 5000</td>
<td></td>
</tr>
<tr>
<td>Day 5: 4500</td>
<td></td>
</tr>
<tr>
<td>Day 6: 3500</td>
<td></td>
</tr>
<tr>
<td>Day 7: 5000</td>
<td></td>
</tr>
</tbody>
</table>

Total for the Week: 28000
Your Baseline Average = 28000/7 = 4000

Initial step count averaged from one-week log
Each week I'll ask you to add about 500 steps a day to your starting point average. That’s about 5 minutes more each day. By the end of the Guide-to-Health program we hope you can add at least 3000 steps to most of your days.

- **Step-goal orientation**
  - If goal is met 5+ days, add 500 steps
  - If 4 days or less, goal remains the same

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Step Program

- **Church-based feedback in GTH-plus**
  - **step-goal for individual churches**
    - based on participants achieving individual weekly step goals
    - shoes posted every week
    - fellowship hall, newsletter
  - step-goal badges presented to recognize successful walkers

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Our goal is to walk 6000 miles by the end of April. Be sure to log on to report your step goals.

Guide-to-Health.com users have walked over 1,200,000 steps and 600 miles as of March 1!

* Each walking shoe = 200,000 steps or 100 miles.

• Sample newsletter step-goal progress

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Nutrition Program

- Increase fiber, fruits and vegetables
  - fruits and vegetables, whole grains, beans
  - selection of strategies
  - goals (1 serving/day per week)

- Decrease fat
  - salty snacks, high fat meat, sweets, high fat dairy
  - strategies
  - goals (no more than one of each per day)

- Decrease sugared beverages
  - sodas, fruit flavored drinks, sugared sweetened tea
  - strategies
  - goals (no more than one a day)
Eating more high-fiber breads and cereals will reduce your risk of heart disease, diabetes, and some cancers. It also helps your digestive system move more quickly.

Sample nutrition content

Center for Research in Health Behavior, Department of Psychology
Here are some strategies to help you increase fruits & vegetables.

Choose as many as you’d like to try this week:

- I prefer not to choose a strategy.
- Have fruit or juice (either fruit/vegetable) at breakfast.
- Eat fruit or vegetables as a snack.
- Pack fruit or vegetables in your lunch.
- Have a fruit or vegetable at lunch or dinner.

**SEND IT IN!**  **CLEAR FORM**
Nutrition Program

- Church-Based Supports
  - Individual progress compared to church progress
    - based on all participants from church
  - Weekly progress reports
  - Church bulletins, newsletters, posters
    - Weekly target food goals
    - Numbers reaching target food goals
    - Strategies to reach target food goals
Here's an EXAMPLE feedback screen. It helps explain the data you will see on the next screen. If you have questions about the data we show you, please contact the Project Staff for more information.

Your Goal: AT LEAST 5 SERVINGS PER DAY

<table>
<thead>
<tr>
<th>NUMBER OF SERVINGS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>YOUR GOAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOW MANY YOU ATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHURCH AVERAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number OTHERS now eat/drink.

Number you now eat/drink.

How many to aim for.

Church Data

- Individual and church feedback
Guide-to-Health.com Users Improve Their Eating Habits!

<table>
<thead>
<tr>
<th>Nutrition Goals</th>
<th>Start of Program</th>
<th>Module 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Fruit and Vegetables</td>
<td>46.9%</td>
<td>83.3%</td>
</tr>
<tr>
<td>6 Servings of Fiber</td>
<td>8.3%</td>
<td>0%</td>
</tr>
<tr>
<td>One Sweet Per Day</td>
<td>62.5%</td>
<td>95.8%</td>
</tr>
<tr>
<td>One Soda/Day</td>
<td>95.8%</td>
<td>90.1%</td>
</tr>
<tr>
<td>One Meat Serving/Day</td>
<td>95.8%</td>
<td>90.1%</td>
</tr>
</tbody>
</table>

Sample progress report from newsletter

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### Interactive fast food planner

- **750 kcal, 28 g fat**

---

**Church-Based Guide to Health**

**Interactive fast food planner**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Calories Per Item</th>
<th>Fat Grams Per Item</th>
<th>Fiber Grams Per Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grilled Chicken Soft Taco</td>
<td>200</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Grilled Steak Soft Taco</td>
<td>200</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Grilled Steak Soft Taco Supreme(TM)</td>
<td>240</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Soft Taco</td>
<td>210</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Soft Taco Supreme(TM)</td>
<td>260</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Steak Chalupa Baja(TM)</td>
<td>400</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>Steak Chalupa Santa Fe(TM)</td>
<td>430</td>
<td>27</td>
<td>2</td>
</tr>
<tr>
<td>Steak Chalupa Supreme(TM)</td>
<td>360</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Steak Gordita Baja(TM)</td>
<td>340</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>Steak Gordita Santa Fe(TM)</td>
<td>380</td>
<td>23</td>
<td>5</td>
</tr>
</tbody>
</table>

**PAGE Totals:**

<table>
<thead>
<tr>
<th>Calories</th>
<th>Fat Grams</th>
<th>Fiber Grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>21</td>
<td>6</td>
</tr>
</tbody>
</table>
Last week’s step count target was 2500 steps.

How many days were you able to accumulate that many steps?

<table>
<thead>
<tr>
<th>Prefer Not To Answer</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Send It In! Reset

Check-in from the previous week

Feedback follows
Helpful self-regulation strategies

Module 1: Fruits and Vegetables
Park a short distance away from your destination.
Make finding ways to add steps a game!
Church-Based Guide to Health

Planning is emphasized

- Activities that will increase step counts

<table>
<thead>
<tr>
<th>Activity</th>
<th>Day</th>
<th>Time of Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobics</td>
<td>Saturday</td>
<td>Morning</td>
</tr>
<tr>
<td>Housecleaning</td>
<td>Saturday</td>
<td>Afternoon</td>
</tr>
<tr>
<td>Work On The Car</td>
<td>Sunday</td>
<td>Afternoon</td>
</tr>
<tr>
<td>Active Play</td>
<td>Everyday</td>
<td>Evening</td>
</tr>
<tr>
<td>Aerobics</td>
<td>Wednesday</td>
<td>Evening</td>
</tr>
<tr>
<td>Lawn/Yard Work</td>
<td>Monday</td>
<td>Evening</td>
</tr>
<tr>
<td>No Activity</td>
<td>None Selected</td>
<td>None Selected</td>
</tr>
</tbody>
</table>

Use the drop-down lists to select:

- The activities you'll do
- The days you'll be active
- The times of day you'll do your activities

- I prefer not to make a plan.

No. of Planned Activity Sessions: 12
No. of Active Days: 7
Try These Nutrition Strategies This Week:

<table>
<thead>
<tr>
<th>Category</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits/Vegetables</td>
<td>Have fruit or juice (fruit or vegetable) at breakfast.</td>
</tr>
</tbody>
</table>

Aim to Accumulate This Many Steps Most Days This Week:
3000

Your Activity Plan

<table>
<thead>
<tr>
<th>Activity</th>
<th>Day of the Week</th>
<th>Time of Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Play</td>
<td>Everyday</td>
<td>Evening</td>
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<tr>
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<tr>
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<td>Wednesday</td>
<td>Evening</td>
</tr>
</tbody>
</table>

Step Count Log
Click Here to Logout

“Send Off” summary

- nutrition strategies selected, step count goal, and activity plan

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Administrator Options

0. Test a Module
1. View/Add/Delete Fast Food Items
2. Track Participants' Progress
3. Track Participants' Food Assessment Data
4. Track Participants' Fast Food Meal Choices
5. Track Participants' Step Goals
6. Track Participants' Activity Plans
7. Track How Helpful Users Found Activity Planner
8. Track Frequency of Strategies Selected
9. Track How Frequently Participants Used Selected Strategies
10. Report Frequency of Participants' Goals
11. Report Frequency of Participants' Obstacles
12. Update Participant's Activity Status
13. Update Participant's Password and/or Email

Administrator section

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Recruitment

- 14 Enroll of 23 Churches Contacted
  - 3 African American Baptist, 3 United Methodist, 6 Baptist
- ‘Active Members’
  - Recruit 65%, Enroll 50%, Assess 40%
  - Retain 35 - 40%
  - N=1071
- 33% male, 23% African-American
- 57% with BMI ≥ 25, 60% sedentary,
- median age 53 years

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Program Engagement

- GTH-PLUS more likely to log on
  - (80% vs. 57% GTH-only)
- GTH-PLUS viewed more modules
  - (7 vs. 5)
- GTH-PLUS more likely to view all 12 modules
  - (40% vs. 25%)

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Average Daily Step Counts

GTH-Plus adds more steps at immediate post (p < .05). Increase marginally maintained at 12 months (p = .10)

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Moderate Exercise

GTH-Plus adds more exercise at immediate post (p < .01).

Maintenance at 12 months ns

Weekly Exercise MetHrs

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Fat Consumption

GTH-Plus decreased fat at immediate post (p = .06)

Percent Calories from Fat

Guide to Health Condition

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F&V Consumption

Both groups add more servings at immediate post (p < .01) with maintenance at 12 months (p < .05)
Fiber Consumption

Both groups add more fiber at immediate post (p < .01) with maintenance at 12 months (p < .05)

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Nutrition Self-Regulation

Both groups use strategies for frequently (p < .01)

Nutrition Self Regulation

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Walking Self-Regulation 1

Both groups use strategies more frequently at post and 12-months (p < .01)

GTH-PLUS more frequently than GTH-Only at 12 months (p < .05)
Walking Self-Regulation 2

Both groups use strategies more frequently at post and 12-months (p < .01)
SCT Mediators – Physical Activity

Treatment related changes in SCT variables at Immediate Post predict Change in Physical Activity at 12-month follow-up.

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SCT Mediators – Decrease in Fat

Treatment related changes in SE and SR at Post predict Change in Physical Activity at 12-month follow-up.

Center for Research in Health Behavior, Department of Psychology
SCT Mediators – Increase in Fiber, F&V Treatment related changes in SE and SR at Post predict Change in Physical Activity at 12-month follow-up.

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Social Support Predicts change in PA and Nutrition.
Harder to change support for dietary change?

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Weight Gain Prevention Outcomes

Both groups decrease body weight at immediate post
Implications (so far)

- **Web-based interventions and research**
  - effective, accessible, can be individually tailored
  - attrition rates of engaged participants comparable to community-based interventions
  - attrition rates of assessed participants may be higher

- **Modest changes in physical activity and nutrition in sedentary, obese adults**
  - prevent weight gain
  - may contribute to weight loss

- **Self-regulation focus**
  - goal setting and planning guidance combined with self-monitoring may be effective alone
  - tailored feedback, specific planning may not give added-value
Implications/Directions

- **SCT Based Interventions Need to Focus More on Self-Regulation**
  - Goal Setting, Planning, Monitoring
    - Minimal changes for maximum results
  - Very Few True *Self-Regulation* Programs

- **Simplify Assessments and Intervention**
  - Supports for Greater Use and Adherence

- **Physical Activity is Fundamental To Health**
  - Maintenance remains difficult
    - Access to intervention over longer time
  - Walking is feasible, highly acceptable
    - Adding lifestyle steps may not be enough
Next Generation GTH

- **Web-based Guide to Health**
  - focused more on *self-regulation*
    - Goal setting, planning, monitoring, as iterative, corrective and reinforcing processes
    - good health and caution foods and weight monitored
    - steps and minutes walked planned and monitored
    - tailored feedback and planning
  - **Internet promises greater reach, greater fidelity**
    - Assessments entirely online
    - Interventions can be elegantly tailored
    - Text to speech broadens reach

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Keep walking as you have! You should also weigh yourself everyday and cut back on caution foods until you get back down to the weight you were when you started Guide to Health.

This week I will aim for:
- [ ] weighing 3 times a week
- [ ] weighing 5 times a week
- [x] weighing everyday

➢ Web-based GTH weight gain prevention strategy selection

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Okay. Here's everything you need to meet your nutrition and walking goals for this week.

Click the "Walking Log" button to get a walk log.
Click the "Food Log" button to get a food log.

Your Walking Goals

- Average number of steps per day: 5644
- 5 Planned Walks
- 30 Minute Per Planned Walk
- 1 Planned Fitness Walk
- 30 Minutes Per Fitness Walk

Your Nutrition Goals

- 5 Fruits & Vegetables a Day
- 3 Whole Grain Servings a Day
- 3 Low-Fat Dairy Servings a Day
- No More than 28 Caution Food Servings a Week

Remember to weigh yourself on Tuesday in the Evening.

Web-based GTH summary goal sheet and links to tracking tools

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Web-based Program Results (so far)

- **Web-based interventions and research**
  - effective, accessible, can be individually tailored
  - attrition rates of engaged participants comparable to community-based interventions
  - attrition rates of assessed participants may be higher
- **Modest changes in physical activity and nutrition in sedentary, obese adults**
  - prevent weight gain
  - may contribute to weight loss
- **Self-regulation focus**
  - goal setting and planning guidance combined with self-monitoring may be effective alone
  - tailored feedback, specific planning may not give added-value
  - may be more important for maintenance

*Center for Research in Health Behavior, Department of Psychology*
Thank You