Interactive Learning
for Congregate Nutrition Site Nutrition Education:
A Pilot Study

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ABSTRACT. Older adults who participate in the Older Americans Act Title III-C Elderly Nutrition Program often are at moderate to high nutritional risk. Although nutrition education is a component of the Elderly Nutrition Program, there are numerous barriers to promoting behavior change in older adults. Nutrition education programs targeted to congregate nutrition site participants must address their unique nutritional needs, while engaging them in activities that promote learning and motivate them to make positive behavior changes. This paper describes a pilot study of a theory-driven, five-lesson educational module designed to promote healthful eating behaviors among congregate nutrition site participants through interactive learning. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2003 by The Haworth Press, Inc. All rights reserved.]

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INTRODUCTION

The percentage of the U.S. population that is age 65 years and older is growing, and as the “baby boom” population ages, older adults are expected to be 13 percent of the population by the year 2005, and 18.5 percent by 2025 (U.S. Census Bureau, 1999). In Florida, with the highest percentage of older adults of all the states, the projections are for persons over 65 years to be 17.6 percent of the population by the year 2005, and 26 percent by 2025 (Bureau of Economic and Business Research, 2001; U.S. Census Bureau, 1999). While many older persons enjoy an active and healthy lifestyle, as a group older adults are at risk for malnutrition due to physiological, socioeconomic, and psychological factors that influence their food choices. An estimated 37 to 40 percent of the nation’s community-dwelling older persons have inadequate nutrient intake (Institute of Medicine, 1999). Those who have limited resources are particularly vulnerable to poor nutritional status and associated health problems, such as heart disease, stroke, cancer, and diabetes mellitus.

Older Americans Act (OAA) programs provide health, social, and nutrition services to older adults, particularly to elders at high risk, including low-income minorities and those living in rural areas (Mathematica, 1996). Title III of the OAA supports a range of services including community-based services like Title III-C, the Elderly Nutrition Program, which includes congregate nutrition site (CNS) meals and home-deliv-
ered meals (Administration on Aging, 2002). Sixty-four percent of participants at CNSs have been found to be at moderate to high nutritional risk (Mathematica, 1996). In addition to providing meals and social interaction, the Elderly Nutrition Program requires that CNSs offer nutrition education (Administration on Aging, 2002).

The overall goal of nutrition education in older adults is to promote healthful eating behaviors to reduce risk of malnutrition and improve health. It can be a challenge to engage older people in the learning process due to changes in hearing, eyesight, and attention span (Kicklighter, 1991). Educational experiences that involve older adults and call upon their life experiences and ideas are more likely to engage this audience than lectures and other didactic approaches (Kicklighter, 1991; McClelland, Bearon, Fraser, Mustian, & Velazquez, 2001). However, the CNS setting poses numerous challenges for nutrition educators, including noise, foot traffic, smells from lunch being prepared, pre-scheduled recreation and social activities, and lack of appropriate physical set-up for learning activities.

When the targeted outcome is behavior change, the educator needs to be aware that older adults may not readily change their eating behaviors due to reluctance to change eating habits developed over many years and/or a sense that it is “too late” for them to reduce their health risks. Nutrition education programs that address these and other barriers to behavior change are more likely to be successful in promoting healthful eating behaviors in elders. A number of theoretical models have been found to be useful in development of nutrition education programs (AbuSabella & Achterberg, 1997; Contenko, Balch, Bronner, Lytle, Maloney, Olson, & Swadener, 1995; Kristal, Glanz, Curry, & Patterson, 1999), but research using sound theoretical approaches in nutrition programs for elders has been limited (McClelland, Bearon, Fraser, Mustian, & Velazquez, 2001). This pilot study investigated the effectiveness of a five-lesson theory-driven elder nutrition module on knowledge gained and behavior changes planned at post-test in elders attending a rural CNS.

**METHODS**

**Program Development**

The educational module being pilot tested in this study is part of a larger program, Elder Nutrition and Food Safety (ENAFS), that was designed to promote the nutritional and overall health of elders attending CNSs in the State of Florida (Martin & Bobroff, 2000). Faculty with ex-
pertise in nutrition, food safety, gerontology, and consumer education developed the lessons and consumer materials. All materials were peer reviewed by six or seven experts including faculty at the University of Florida, county Extension faculty, and aging network personnel such as registered dietitians and program administrators. Feedback from the reviewers was used to improve the lessons and consumer education materials prior to program implementation.

The topics included in the program were selected based on input we received from educators who teach at CNSs in the state via an email survey of Title III dietitians and county Extension agents (Martin & Bobroff, 2000). We used components of the expanded Health Belief Model (which incorporates self-efficacy as a construct) (Bandura, 1977) and Stages of Change (Prochaska & DiClemente, 1982) to design the lessons. Our focus in creating the learning activities was to engage CNS clientele in the learning process through interactive discussions and hands-on activities. The interactive discussion, which is presented in question and answer format, encourages the clients to express their knowledge and opinions, and engages the group in a lively discussion.

We begin the lesson with an icebreaker, which is introduced with a humorous overhead or question. This helps the clients relax and get ready for the discussion. For example, in the Fluids lesson, our Ice-breaker overhead is a cartoon of a camel drinking from a bottle of water. We mention how long a camel can go without drinking (for months), and then how much water they can drink in a day when they are thirsty (up to 53 gallons). During the interactive discussion we begin to focus on cues for behavior change (perceived susceptibility and perceived seriousness in the Health Belief Model), as well as strategies for behavior change and tips for decreasing barriers to change. In the Fluids lesson, we begin the discussion with a look at water distribution in the body, and mention problems, such as constipation, that can occur when we don’t get adequate fluids. Since many older persons have trouble with constipation, but are often reluctant to increase fluid intake due to frequent visits to the bathroom, learning how fluids can help prevent this problem can be a motivator. We conclude the discussion with tips for getting adequate fluids, and distribute a tip sheet to take home. Using this approach, we include information that can be helpful to clients at various stages of readiness to change, from no interest in changing at this time to maintaining behavior changes already made. The games and other activities that follow the interactive discussion reinforce the concepts and further engage the clients in the learning process. In the Fluids lesson, the Rate Your Drink activity uses happy and sad faces to reinforce the concept that some fluids are better choices than others.
We include in each lesson plan suggestions for adapting the activities to allow elders with physical limitations to participate. For example, in the Fluids lesson, instead of having participants individually rate each drink, they can talk about them in groups and rate them together. In activities that involve writing, the educator can present the activity on an overhead or a sign and have the group work on it together. The overall goal of each lesson is to motivate participants to make at least one positive behavior change in their dietary or other lifestyle choices. To reinforce the lesson concepts and provide practical tips for implementing behavior changes, we developed consumer handouts for each lesson. The handouts use simple language, and are prepared with an easy-to-read 14-point font size. We incorporated clip art and adequate white space to facilitate readability.

We designed the lessons to be used within a variety of CNS environments, and with older persons from diverse backgrounds and abilities. All handouts were provided in English and in Spanish. Handouts for some lessons were translated into Haitian Creole and Vietnamese, and a limited number were put into Braille format.

Pilot Study Design

We selected for this pilot test a five-lesson module in the ENAFS program that addresses critical nutrients and healthful eating for the target population. The five lesson topics are: (1) Food Guide Pyramid for Elders, (2) Fluids, (3) Dietary Fiber, (4) Calcium and Vitamin D, and (5) Vitamins and Minerals. Participants in the study consisted of a convenience sample of attendees at a CNS in a rural community in north-central Florida. All attendees were encouraged to participate, but were free to decline the invitation. We enlisted the support of local partners—in Extension, the local Area Agency on Aging, and at the CNS—who facilitated implementation of the module in the county. Evaluation of the effectiveness of the partnership is described elsewhere (Bobroff, submitted). Nutritional status of CNS clients is evaluated annually using the portion of an Intake Referral Form that is based on the Nutrition Screening Initiative (NSI) checklist. NSI data were provided to the researchers as an indicator of baseline nutritional risk for the group.

The local Extension Family and Consumer Sciences agent taught the five lessons at the CNS over a six-week period on Tuesdays, a day on which many clients regularly attend. One of the authors (JHB) observed each lesson and recorded observations about client involvement and re-
actions to the lessons. The CNS registered dietitian observed three of the five lessons, and CNS personnel recorded attendance at each lesson.

We obtained data on knowledge gained and planned behavior changes from evaluation questionnaires completed by clientele after each of the five lessons. Two months after the last lesson, we interviewed five of the elders who attended all or most of the five lessons. We asked the clients for their impressions about the format of the lessons, their length and subject matter, and the activities. All interviewees signed an informed consent form and all interviews were recorded on audio cassettes. Incentives, in the form of gift certificates to a local supermarket, were distributed to all participants after completion of the study. The University of Florida Institutional Review Board approved the entire protocol.

Evaluation Materials

Each ENAFS lesson includes a simple evaluation questionnaire that measures knowledge gained and planned behavior change specific to each lesson in the following format:

1. How much did you learn from this lesson?
   - □ Very Little
   - □ Some
   - □ A Lot

2. Do you plan on making any changes in what you eat as a result of participating in this lesson?
   - □ Yes
   - □ No

3. If you answered “yes,” please tell us what you plan to do. Check all that apply!
   - □ I plan to [behaviors listed are specific to the lesson].
   - □ I plan to do something else to improve my health. Please explain: __________________________
   - □ I plan to share the information with a family member or friend.

4. Comments: _____________________________________________________________________
For the third question, the first answer choice varies according to which lesson is being evaluated. For example, in the lesson about the Food Guide Pyramid for Elders, the first answer choice for question three is: “I plan to eat food from all five food groups every day.” Question 3 in most of the lessons includes multiple behaviors that can be checked.

**Data Analysis**

Results of the lesson post-test evaluations were tabulated and summarized using descriptive statistics. The interviews were transcribed from the audio recordings, and answers to each question were categorized to identify specific attitudes and behaviors.

**RESULTS**

**Demographics of the Congregate Nutrition Site**

Clients at the CNS site ranged in age from 55 to 103 years. The majority are white and female, and they are at a wide range of educational levels. NSI Determine Checklist data collected from 18 participants prior to this study indicated that 89 percent of the clientele at this meal site were at medium (39 percent) or high (50 percent) nutritional risk, making this a critical target population for nutrition education. Between 36 and 52 seniors at the CNS attended the five lessons, and an average of 20 (17 to 23) completed the evaluations.

**Client Participation**

Client participation was assessed by observing their responsiveness and involvement in the discussion and activities at each lesson. At each class, most participants appeared to be engaged in the activities and excited about the program. The instructor had previously established rapport with the clientele, and is an experienced educator. The discussion question and answer format in the lessons kept the attention of the clients. In each of the five lessons, following the interactive discussion, the clients participated in and appeared to enjoy the learning activities. At the end of each lesson, the instructor served the participants a snack that was an example of what had been discussed during that lesson. For ex-
ample, in the Fluids lesson she made a fruit punch, and for the lesson on Calcium and Vitamin D, she brought in strawberry frozen yogurt.

**Lesson Evaluations**

Table 1 shows results of the lesson evaluations. For three out of the five lessons, approximately 80 percent of the participants replied that they learned “a lot.” For all five of the lessons, at least 61 percent of the participants indicated that they planned to make changes in eating behaviors as a result of participating in the lesson. For three out of the five lessons, 68 to 79 percent of the participants checked a specific behavior change they planned to change, and for all five lessons, at least 11 percent chose to write in their own behavior change. In addition, for three out of the five lessons, 58 to 68 percent indicated that they would share what they had learned with a family member or a friend.

It was rewarding to read some of the comments shared by the clients on the evaluation form as they indicated a high level of attention paid to the lessons: “I didn’t know they had a food pyramid just for seniors.” “I will watch caffeine products more closely and drink more water. It’s very interesting to know how much water a camel drinks per day.” “I learned what to do to help keep my body healthy.”

**Follow-Up Interviews with Participants**

To represent the demographic profile of the CNS, we selected two black females, one white female, and two white males for the follow-up interviews. All interviewees were over age 60 years. One of the five interviewees could not remember the lessons; therefore, his interview was terminated early, and the responses were not included. The other interviewees clearly remembered the lessons and particularly remembered information that applied to them personally.

The clients displayed a high degree of enthusiasm about the ENAFS lessons. All four indicated that they enjoyed the lessons and that they felt the topics related to them. Three of the four said they learned something new, but only two stated that what they learned would cause them to change a behavior. Barriers to implementing behavior changes that were mentioned are lack of control over their intake (i.e., they do not do the cooking) or long-term eating habits that are hard to change. All four felt that the information in the lessons reaffirmed previous knowledge, and three said that this reaffirmation would cause them to make a change in their diet or in health decisions. When asked about the possi-
TABLE 1. Results of Post-Test Lesson Evaluations

<table>
<thead>
<tr>
<th></th>
<th>Lesson 1 Pyramid (n = 19)</th>
<th>Lesson 2 Fluids (n = 17)</th>
<th>Lesson 3 Dietary Fiber (n = 28)</th>
<th>Lesson 4 Ca and Vit D (n = 18)</th>
<th>Lesson 5 Vit and Min (n = 22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount Learned:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Little</td>
<td>0</td>
<td>0</td>
<td>4 (14%)</td>
<td>2 (11%)</td>
<td>0</td>
</tr>
<tr>
<td>Some</td>
<td>4 (21%)</td>
<td>3 (18%)</td>
<td>10 (36%)</td>
<td>9 (50%)</td>
<td>4 (18%)</td>
</tr>
<tr>
<td>A Lot</td>
<td>15 (79%)</td>
<td>14 (82%)</td>
<td>12 (43%)</td>
<td>7 (39%)</td>
<td>18 (82%)</td>
</tr>
<tr>
<td>Plan Changes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17 (90%)</td>
<td>13 (76%)</td>
<td>18 (64%)</td>
<td>11 (61%)</td>
<td>17 (77%)</td>
</tr>
<tr>
<td>No</td>
<td>2 (11%)</td>
<td>2 (12%)</td>
<td>9 (32%)</td>
<td>7 (39%)</td>
<td>4 (18%)</td>
</tr>
<tr>
<td>Type of Changes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson-specific</td>
<td>15 (79%)</td>
<td>12 (76%)</td>
<td>11 (39%)</td>
<td>7 (39%)</td>
<td>15 (68%)</td>
</tr>
<tr>
<td>Choice 2</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>4 (22%)</td>
<td>13 (59%)</td>
</tr>
<tr>
<td>Choice 3</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2 (11%)</td>
<td>4 (18%)</td>
</tr>
<tr>
<td>Another change</td>
<td>4 (21%)</td>
<td>2 (12%)</td>
<td>4 (14%)</td>
<td>2 (11%)</td>
<td>4 (18%)</td>
</tr>
<tr>
<td>Share information</td>
<td>11 (58%)</td>
<td>10 (59%)</td>
<td>13 (46%)</td>
<td>7 (39%)</td>
<td>15 (68%)</td>
</tr>
</tbody>
</table>

Note: Clients completed an evaluation immediately after each of the five lessons. Under "Type of Changes," Lessons 4 and 5 included three choices. Clients could choose more than one response.

The majority (89 percent) of clients at the CNS for whom we have NSI data were at moderate or high nutritional risk, well above the average 64 percent found in the National Evaluation of the Elderly Nutrition Program 1993-95 (Mathematica, 1996). In Nevada, Benedict et al. (1999) screened over 2,000 persons 60 years and older and found 54 percent to be at moderate or high nutritional risk. The high percentage of at-risk clientele in this study reflects the CNS clientele in the county who are mostly rural and poor, and thus more likely to be at high nutritional risk.

The ENAFS lessons were designed to involve the clients in interactive discussions and activities, including games such as ENAFS Food Guide Pyramid BINGO. A nutrition game, Pyramid Power,™ was re-
cently reported to be a successful tool for educating seniors about specific nutrition concepts (Peterson, 2002). Based on the observational data and comments of the four interviewees, we were successful in engaging the participants in the activities, and we believe this facilitated learning as reported by clients in their evaluations.

To encourage behavior change, we included practical tips on how to implement dietary recommendations, which are reinforced by the educational materials that the clients take home after each lesson. This approach is supported by research that demonstrates the importance of accomplishing more than increasing nutrition knowledge if the intent is behavior change in a nutrition education program (Sims, Shepherd, Price, & Randell, 1995). Hermann and co-workers found that incorporating practical advice for implementing dietary recommendations was effective in encouraging dietary behavior changes in older adults who attended an eight-session Extension nutrition education program (Hermann, Brown, & Heintz, 2000). One of our goals in providing take home materials is to reduce barriers to change by providing tools that make behavior change easier to accomplish, such as cues to action, simple recipes, and practical tips for getting adequate amounts of critical nutrients like water, calcium, and vitamin D. The Partners in Wellness program provided program participants personalized “education extenders” that were take-home materials designed to reduce barriers to change (McClelland, Bearon, Fraser, Mustian, & Velazquez, 2001).

Although our sample size was small, which limits generalizing the results, we have received additional evaluation data from six counties that support the overall positive findings (unpublished data). For example, for Lesson 1, of 154 persons evaluated (out of 166 program participants in six counties), 121 (79%) learned some or a lot and 123 (80%) planned to change behaviors. Three counties reported results for Lesson 2: Of 67 persons evaluated (out of 69), 63 (94%) learned some or a lot and 59 (87%) planned to change at least one behavior. In addition, informal feedback from county Extension faculty who have used this educational module in rural and urban counties, indicates that the program is well received and effective in promoting behavior change in elders in a variety of CNS settings (unpublished data).

The congregate nutrition site setting is generally not amenable to “test taking,” and clients often do not care to complete questionnaires. Therefore, the ENAFS evaluation instruments were designed to be easy for the clients to complete. Still, in counties with a large proportion of low literacy clientele, it may be necessary to read the evaluation questions aloud or provide individual assistance to clientele who are unable
to complete the form. In this study, the instructor assisted some of the participants in filling out the evaluation, and this may have biased their answers. Also, the simplicity of the questionnaire, while making it more likely that it will be completed, limits the information that is obtained. For example, we did not assess specific knowledge gained as with a pre- and post-test design.

We measured planned behavior change, rather than actual behavior change, in this study since the clients completed the evaluation immediately following each lesson. This was done to get immediate information from the group, since it can be a challenge to collect follow-up data from this population.

McClelland et al. (2001) discussed challenges often faced when teaching at CNSs, and we did experience some of these. The large room in which the lessons were taught is at the entrance to the senior center, and people coming in and going out the front door walked across the front of the room during the lesson. The front desk is next to the door, and the telephone could be heard ringing during the lessons. Also, the lessons were held right before lunch time and the kitchen area, which is a part of the room, was noisy as people prepared lunch, and the aromas were distracting. Despite these intrusions, the educator was able to keep the participants involved in the lesson by engaging them in the interactive discussion and keeping them involved in the activities.

**IMPLICATIONS FOR RESEARCH AND PRACTICE**

Overall, the feedback obtained from the clients reported in this paper, and from the county Extension agent and CNS personnel, was affirming for the program staff, and will be used to improve program implementation statewide. The ENAFS program design in general and this educational module in particular were successful in engaging the older persons in the learning experience and promoting an intent to change behavior. The CNS participants were highly enthusiastic about the program and looked forward to participating in future lesson activities. Based on the written lesson evaluations, the lessons were effective in promoting knowledge gain and encouraging behavior change among program participants at this CNS. In order to determine actual behavior changes, follow-up evaluation with a larger sample of program participants, preferably using a combination of quantitative and qualitative evaluation approaches, will be needed. We are exploring funding opportunities that will allow us to pursue this avenue.
There are many challenges for nutrition educators who want to help older adults make healthy lifestyle choices. We found that using interactive learning approaches for CNS nutrition education is an effective way of engaging older persons in educational activities that teach important nutrition messages and promote healthful eating behaviors. Enhanced nutrition education has the potential to improve the nutritional status and health of CNS clientele and reduce health care costs.

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