

AN EDUCATIONAL INTERVENTION IN GEORGIA ELDERLY NUTRITION
PROGRAMS IMPROVES KNOWLEDGE AND BEHAVIORS RELATED TO
NUTRITION AND PHYSICAL ACTIVITY

by

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(Under the direction of Mary Ann Johnson, Ph.D.)

ABSTRACT

The goal of this community-based, statewide intervention program was to improve the nutritional status, functional ability, and physical activity of older adults participating in Title III congregate meal programs in Georgia. A convenience sample (n = 501, mean age = 76, 17% men, 83% women, 65% Caucasian, 35% African American) completed the pre-test, a series of nutrition education and physical activity sessions, and post-test. The following measures showed significant improvements after the intervention ($p < 0.05$): knowledge that 5 servings of fruits and vegetables are recommended daily (from 34 to 64%), consumption of vegetables, not including potatoes, carrots, or salad (from 1.6 to 1.8 servings/day), knowledge that saturated fat increases risk of heart disease (from 55 to 77%), walking speed in 8-foot-Up-and-Go (from 9.8 to 9.1 seconds), and performed leg exercises in the past week (from 55 to 82%). In conclusion, this intervention improved knowledge and behaviors related to nutrition and fitness.

INDEX WORDS: Elderly Nutrition Program, Congregate meal program, Nutrition education, Functional ability, Physical activity, Intervention.

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CHAPTER I

INTRODUCTION

The number of elderly Americans has increased dramatically in recent years, and this trend is expected to continue and even escalate in the coming years. The Department of Health and Human Services Administration on Aging has predicted that the proportion of elderly in the US population will rise from the current 13% to 20% of the U.S. population by 2030 (AoA, 2000). The fastest growing age group is the oldest-old, those who are 85 years or older. As the composition of the American and world population changes to reflect the increasing numbers of older adults, research will continue to focus on successful aging and ways to improve quality of life.

Adequate nutrition is essential for maintaining health, functional independence, and quality of life. The Administration on Aging's Elderly Nutrition Program (ENP) was established in 1972 to fund nutrition and social service programs for adults 60 years of age and older. Also known as the Title III Nutrition Program, this service is intended to improve the dietary intakes of older adults, with emphasis given to those at greatest risk of nutrition problems, based on factors such as low income, physical disability, and social isolation (Ponza et al., 1996). The Elderly Nutrition Program is the largest U.S. community nutrition program for older adults, serving over 3 million meals daily across the nation, and more than 38,000 Georgians in FY 1999 (GA-DHR, 2002). An Executive Summary of Title III programs reported significant health problems within this population (Millen et al., 2002; Ponza et al., 1996). Many of these health problems, such

as cardiovascular disease, hypertension, diabetes mellitus, and obesity, are related to nutrition and physical activity and therefore can be potentially lessened by nutrition education and health promotion programs.

Prior research in the Department of Foods and Nutrition at the University of Georgia has exposed the high-risk status of many Elderly Nutrition Program participants in northeast Georgia, providing a snapshot of the probable characteristics of Elderly Nutrition Program participants across the state of Georgia. These studies found that more than 50 percent of participants were at high nutritional risk (according to NSI scores), that more than 30 percent were obese, had self-reported diabetes or poor glucose control, and were hypertensive, and that many have impairments in activities of daily living (Accettura, 2000; Aspinwall, 2001; Brackett, 1999). Data from these studies in Georgia, as well as from the national evaluation of the Elderly Nutrition Programs, indicate that this population is at great nutritional risk, as well as increased risk for poor health overall and could benefit markedly from nutrition and health education programs.

In 2000 and 2001, the Georgia Division of Aging Services partnered with private and state agencies across Georgia to implement the Take Charge of Your Health Active Older Adults Speaker's Kit and Placemat Leg Exercises. The underlying messages for this program were from the Georgia Coalition for Physical Activity and Nutrition (G-PAN, 2002) which emphasizes increasing physical activity, increasing fruit and vegetable consumption, and decreasing dietary fat. The evaluation of a combined nutrition and physical activity intervention targeted to older adults in the Elderly Nutrition Program in the Southeast United States is lacking. Therefore, this evaluation is of great value for the wellbeing of the older adults served and for the state in its quest to

provide nutrition and health promotion activities and services for this population. This study evaluated the ability of this nutrition education and physical activity intervention program to improve knowledge about nutrition and physical activity, to promote optimal dietary intake and physical activity, as well as to initiate other behavior changes that improve overall health and well being.

CHAPTER II

LITERATURE REVIEW

Background

The long-term goals for this community based project are to develop, implement, and evaluate nutrition education and exercise intervention programs for older adults participating in the Elderly Nutrition Program. This research and service team was asked by the Georgia Department of Human Resources Division of Aging Services, the primary funding source of this study, to implement and evaluate a nutrition education curriculum and balance exercise program for use in Georgia Elderly Nutrition Programs. The study was conducted in 2000 and 2001 and involved implementation and evaluation of the nutrition education and balance exercise program across the state.

The state of Georgia can benefit from this type of project that will increase the availability of education materials targeting a growing population at high risk for chronic disease risk factors, improve the ability to track the health and fitness status of this population, and ultimately reduce health care costs as these older adults improve their nutrition and fitness.

The nutrition education curriculum, known as the Take Charge of Your Health Active Older Adult Speaker's Kit and Placemat Leg Exercises, was developed by the Georgia Division of Aging Services and Wellness, Inc. of Atlanta, GA. This nutrition education program focuses on correcting risk factors for poor nutrition in older adults and facilitating the voluntary adoption of eating and other nutrition related behaviors that

promote health and well-being in older adults. According to the authors, this curriculum was designed to help older adults understand the importance of incorporating healthy habits into their daily lives and to encourage them to ‘Take Charge of Their Health.’ The key themes of this curriculum focus on the three Take Charge of Your Health campaign messages: Take 5 a Day, Take Down Fat, and Take Action (G-PAN, 2002). The curriculum also followed the principles of the USDA’s Food Guide Pyramid and Dietary Guidelines (USDA, 2000). The 12 lessons include topics such as heart disease and high blood pressure, calcium and osteoporosis, diabetes, and nutrition and cancer prevention. The ability of this education curriculum to meet the needs of the Georgia Elderly Nutrition Program participants was evaluated by pre- and post-test questionnaires.

The balance exercises were suggested by the Department of Aging Services, the Georgia Coalition of Physical Activity and Nutrition, and Wellness, Inc. These exercises included toe raises, side leg lifts, leg curls, knee raises, and straight leg extensions. Modifications for those in wheelchairs, or those otherwise unable to stand, were also included. These exercises were graphically designed on a placemat to help encourage participation and visual cues. This balance exercise program was evaluated by pre- and post-tests of fitness (EPESE and Fullerton Functional Fitness). These evaluations will provide much needed information on fitness level and functional status that will aid in determining the baseline fitness levels of these elders, and in planning future interventions that will closely match their needs. There is very little information available that documents the outcomes of nutrition and physical activity interventions in Elderly Nutrition Programs. A search of MEDLINE using the keywords Elderly Nutrition Program, Congregate Meals, Senior Centers, and intervention and education, produced

limited results. Previous research has focused primarily on documenting poor nutritional status and nutrition risk factors. Information on evaluations of combined nutrition education and physical activity interventions targeting older adults in the Southeastern US is lacking, therefore this study aims to provide a beginning examination into this area.

Nutritional Profiles of Elderly Nutrition Program Participants

The most comprehensive and definitive study of the nutritional profile of Elderly Nutrition Program clients comes from the national evaluation of Title III meals (Ponza et al., 1996; Millen et al., 2002). Participants obtained 45% of their total dietary intake from these meals. Forty-five percent of congregate meal participants reported that the Elderly Nutrition Program is their major source of food, indicating the significance of these meals even for those older adults who are not homebound. The congregate meals programs provide program participants with consistently higher levels of intake for a range of essential nutrients than matched nonparticipants (Millen et al., 2002). However, this evaluation determined that participants are still at nutritional risk due to factors such as eating few fruits, vegetables, and milk products, taking more than three prescription or over-the-counter drugs, and eating alone most of the time. The Elderly Nutrition Program provides numerous services with an emphasis on preventive intervention programs such as the congregate meals and nutrition screenings and education. Many programs also provide other health-related and support services such as information and referral services, assistance with transportation, and various forms of counseling (Millen et al., 2002). Twice as many ENP participants (60%) live alone as the general population of older adults (25%) (Ponza et al., 1996, Millen et al., 2002). Living alone frequently results in eating alone. Ponza et al. (1996) report that food insecurity is prevalent in 10%

of congregate meal participants. According to U.S. Census data (U.S. Census Bureau, 2000), the states with the highest poverty rates for Americans over age 65 are in the Southern United States. Thus, the necessity to improve dietary intake in this highly vulnerable population requires adequate nutrition education and intervention strategies.

Findings from research on the nutritional status of northeast Georgia Elderly Nutrition Program participants are similar to the national evaluation and include low intakes of dairy foods, fruits, and vegetables (Accettura, 2000, Aspinwall, 2001, Brackett, 1999). Several micronutrient deficiencies, including vitamin D, vitamin B-6, and vitamin B-12 deficiency, as well as protein deficiency were documented through blood analyses (Accettura, 2000; Brackett, 1999). Polypharmacy and solitary eating patterns, resembling that of the national picture, were common nutritional risk factors in members of the northeast Georgia Elderly Nutrition Program, as assessed by the Nutrition Screening Initiative (NSI) scores (Accettura, 2000; Brackett, 1999).

Fruit and Vegetable Intake

Epidemiologic evidence suggests that there is a relationship between high fruit and vegetable consumption and the prevention of many chronic diseases, which are seen with increased prevalence in the older population. In recognition of the research into the benefits of fruit and vegetable consumption, many recent health promotion campaigns such as the Dietary Guidelines for Americans (USDA, 2000) and Healthy People 2010 (US DHHS, 2000), recommend that people consume at least five servings of fruits and vegetables each day.

National reports of daily fruit and vegetable consumption indicate that Americans are not meeting the current recommendations. Baseline values for fruit and vegetable

intake in adults (18+) participating in the 5 A Day research trials found an overall mean intake of 3.6 servings daily and only 17% of participants consumed five or more servings per day (Thompson et al., 1999). A review of the National Health Interview Survey (NHIS) of 1992 by Harnack et al. (1998) found that only 7% of Americans knew that five or more servings of fruit and vegetables are needed for good health. Results also indicated that 62% of respondents reported people should eat 2 or fewer servings per day.

Although most reports indicate that older adults tend to consume more fruit and vegetables than younger age groups, the average intake is still below the current recommendation and needs to be improved (Johnson et al., 1998; Donkin et al., 1998). Thompson et al. (1999) also found that respondents 50 years of age or older reported a mean intake of 3.7 fruits and vegetables per day. A study that examined fruit and vegetable intake in a rural African American population in North Carolina found the average daily intake to be 3.57 servings for men and 4.17 servings for women over 66 years of age (McClelland et al., 1998). Cohen et al. (1998) found that perceived barriers to fruit and vegetable intake increased with decreasing income and education and were related to lower consumption of fruits and vegetables. The Behavioral Risk Factor Surveillance System (BRFSS) reported that in 1998 only 21.2% of adults 65 years and older in Georgia consumed five or more fruits and vegetables (BRFSS, 1998).

Results from these and other studies have led programs and officials concerned with the health and wellness of older adults to examine this population in their region. In 2000 it was found that only 25% of northeast Georgia Elderly Nutrition Program participants consume 5 or more fruits and vegetables daily (Aspinwall, 2001). These results mirror the national picture and emphasize the importance of focusing nutrition

education on successful interventions that will improve fruit and vegetable intake and lower the risk of chronic disease.

Nutrition Knowledge

Nutrition knowledge and food patterns developed over one's life influence dietary intake. Lahmann and Kumanyika (1999) found that older adults who are more knowledgeable about or aware of nutrition and health generally have a more healthful dietary pattern. While Medeiros et al. (1991) also found this to be true, they also acknowledged that in populations with low literacy levels and formal education, nutrition knowledge came from informal sources, which are generally considered to be less reliable than formal sources.

While providing valid, pertinent nutrition information is essential for improving health status, knowledge alone will not result in the desired dietary changes. Education and intervention programs must go further and provide practical solutions accepted by the targeted population. According to Rusness (1993), "nutrition education of the poor may be ineffective if it does not address the root problems of poverty and powerlessness." A study on a similar population in Dekalb county Georgia, found that the high incidence of nutrient and energy inadequacy indicated that a better way of implementing nutrition education to improve food intake is needed (Prothro and Rosenbloom, 1999).

The theoretical framework the Take Charge of Your Health Active Older Adults Speaker's Kit and Placemat Leg Exercises program most closely follows is the Health Belief Model. This model is based on the relationship between one's beliefs about a problem and the resulting behaviors (Krinke, 2001). According to Krinke, the 3 factors that influence a person to change a behavior are: 1) the presence of a threat and a

person's perceived susceptibility to it as well as the seriousness of the condition, 2) outcome expectations and a person's perception of the benefits of action and the costs and barriers of action, and 3) efficacy expectations, including one's belief in their ability to carry out the action. In support of this model, Contento (1994) reported that older adults of all socioeconomic backgrounds are willing to make dietary behavior changes if they believe that those changes will contribute to independence and maintenance of functional abilities. In their review of nutrition education programs for older adults, Contento found that programs that focused only on the dissemination of nutrition information yielded improvements in knowledge but fell short in the resulting behavioral and dietary changes. Krinke (2001) gives the following guidelines for developing instructional strategies aimed to produce behavior changes. The method should facilitate gains in food and nutrition knowledge, development of the skills needed to implement the nutritional habits, and the attainment of confidence and commitment to achieve and maintain the new behaviors.

Physical Activity, Fitness, and Function

One of the major benefits of remaining physically active during the aging process is the ability to remain functionally independent. Two common measures used to assess limitations in physical function are activities of daily living (ADL), which include basic self-care activities such as bathing, eating, and walking a short distance, and the instrumental activities of daily living (IADL), which include more difficult aspects of daily functioning that are necessary for independent living and include items such as housekeeping and food preparation (Haskell and Phillips, 1995). Participants in the national evaluation of Elderly Nutrition Programs (Ponza et al., 1996; Millen et al., 2002)

as well as in Georgia Elderly Nutrition Programs (Accettura, 2000) have many impairments in their functional abilities, as assessed by activities of daily living. Five percent of Northeast Georgia Elderly Nutrition Program participants reported one impairment of physical activities of daily living, and 32% had one or more impairments of instrumental activities of daily living (Accettura, 2000).

Recent research has shown that independent older adults can improve their functional abilities through regular exercise. Cress et al. (1999) found that exercise had a beneficial effect on physical function as measured by the Continuous Scale-Physical Functional Performance test (CS-PFP), generating improvements in the exercise group, not just delaying the decline seen in the control group. Performance batteries such as the EPESE and Fullerton Functional Fitness tests also simulate commonly performed daily activities associated with the following domains: (lower body) strength, flexibility, agility, and balance (Guralnick and Simonsick, 1993; Rikli and Jones, 1999). The physiologic components associated with each of these domains and the corresponding routine/daily functional activities are affected by physical activity (Haskell and Phillips, 1995). Guralnick and Simonsick (1993) found that those who participated in moderate to high levels of recreational activity over a three-year period were less likely to develop impairments in their abilities to walk one-half a mile, climb stairs, and do heavy housework.

Many population studies have shown physical activity to be inversely related to several chronic conditions common in the elderly population. Guralnick and Simonsick (1993) found that almost 40% of older adults with chronic diseases reported limitations in their ability to perform basic activities of daily living. Sharpe et al. (1997) showed that

even older adults with multiple chronic conditions can make significant improvements in walking speed, gait, and balance after a year of low-intensity exercise and weight-training.

Despite the widely known benefits of regular exercise, less than 25% of people over the age of 65 take part in appropriate levels of physical activity according to the Surgeon General's Report on Physical Activity and Health (US DHHS, 1996). This report found that physical inactivity is more prevalent among women, minorities, older adults, and the less affluent. Data from the 1999 Behavioral Risk Factor Surveillance System (BRFSS, 1999) indicated no leisure-time physical activity in 41.5% of Georgians 65 years or older. In addition, only 19% reported being regularly active. Participation in a regular physical exercise program and walking program is lower among older adults with less than eight years of education and among African Americans (Clark, 1995). Due to the potential to enhance functional well-being in older adults, and the resulting reduction in chronic disease morbidity and mortality, regular physical activity and improved physical fitness should be a major focus of current nutrition and health education programs.

Rationale, Specific Aims, and Hypotheses

Nutrition knowledge and the ability to make wise food choices influences behavioral patterns, such as dietary intake and physical activity. For many adults with limited formal education, nutrition knowledge is influenced by informal sources such as magazines, newspapers, and television (Medeiros et al., 1991). Results of formal nutrition knowledge tests indicate that many older adults have only a limited knowledge of the foods needed for good health (Probart et al., 1989; Oakland et al., 1990).

Therefore, effective nutrition education and intervention strategies, promoting attainment of the highest levels of health and function, are essential for developing positive nutrition and lifestyle practices in the older population. The importance of health communication has been addressed in Healthy People 2010 (US DHHS, 2000), in the following goal: Increase the quality, availability, and effectiveness of educational and community-based programs designed to prevent disease and improve health and quality of life.

As previously noted, this study was initiated at the request of the Georgia Division of Aging Services. The overall purpose was to evaluate the impact and outcomes of the nutrition education and physical activity program, Take Charge of Your Health Active Older Adults Speaker's Kit and Placemat Leg Exercises program, for use in Georgia Elderly Nutrition Programs. This evaluation also provided valuable information in overall knowledge and behavior related to nutrition and physical activity in Elderly Nutrition Program clients.

The specific aims of this study were to determine:

1. At baseline the prevalence of low nutritional knowledge, poor dietary intake, low physical activity, and low fitness in Elderly Nutrition Program participants;
2. The participation level and impact of the nutrition education curriculum and balance exercises on Elderly Nutrition Program participants' nutritional knowledge, dietary intake, physical activity and fitness, and satisfaction with the curriculum; and
3. Whether or not the curriculum's content and materials meet the needs of Elderly Nutrition Program educators and participants.

The hypotheses of this study were:

1. At baseline, there will be a high prevalence of low nutritional knowledge, poor dietary intake, low physical activity, and low fitness;
2. After completion of the curriculum, participants will increase nutritional knowledge, improve dietary intake, physical activity and fitness, and be satisfied with the curriculum; and
3. Through formative evaluations by educators, the curriculum's content and materials will be shown to meet the needs of older adults with low income and literacy skills.

CHAPTER III

AN EDUCATIONAL INTERVENTION IN GEORGIA ELDERLY NUTRITION PROGRAMS IMPROVES KNOWLEDGE AND BEHAVIORS RELATED TO NUTRITION AND PHYSICAL ACTIVITY¹

¹ McCamey, M. A., Hawthorne, N. A., Reddy, S., Lombardo, M., Cress, M. E., & Johnson, M. A. Submitted to the *Family Economics and Nutrition Review*, 04/01/02.

Abstract

The goal of this community-based, statewide intervention program was to improve the nutritional status, functional ability, and physical activity of older adults participating in Title III congregate meal programs in Georgia. A convenience sample (n = 501, mean age = 76, 17% men, 83% women, 65% Caucasian, 35% African American) completed the pre-test, a series of nutrition education and physical activity sessions, and the post-test. The following measures showed significant improvements after the intervention ($p < 0.05$): knowledge that 5 servings of fruits and vegetables are recommended daily (from 34 to 64%), consumption of vegetables, not including potatoes, carrots, or salad (from 1.6 to 1.8 servings/day), knowledge that saturated fat increases the risk of heart disease (from 55 to 77%), walking speed in 8-foot-Up-and-Go (from 9.8 to 9.1 seconds), and performed leg exercises in the past week (from 55 to 82%). The program was rated as very good or excellent by 64% of the participants. In conclusion, this intervention improved knowledge and behaviors related to nutrition and fitness.

Introduction

Adequate nutrition and physical activity are essential for maintaining health, functional independence, and quality of life. National public policy such as Healthy People 2010 (US DHHS, 2000), the USDA's Food Guide Pyramid and Dietary Guidelines for Americans (USDA, 2000), and the Surgeon General's Report on Physical Activity and Health (US DHHS, 1996) have promoted messages designed to prevent disease and improve health and quality of life for all Americans. Despite the surge in social marketing campaigns, many older adults, and Americans at large, are not meeting these recommendations. The Behavioral Risk Factor Surveillance System (BRFSS)

reported that in 1998 only 21.2% of adults 65 years of age and older in Georgia consumed 5 or more fruits and vegetables (BRFSS, 1998). In an additional report in 1999, data indicated no leisure-time activity in 41.5% of Georgians 65 years or older, and only 19% reported being regularly active (BRFSS, 1999).

The Administration on Aging's Elderly Nutrition Program (ENP) was established in 1972 to fund nutrition and social service programs for adults 60 years of age and older. Also known as the Title III Nutrition Program, this service is intended to improve the dietary intakes of older adults, with emphasis given to those at greatest risk of nutrition problems, based on factors such as low income, physical disability, and social isolation. The Elderly Nutrition Program also provides numerous services with an emphasis on preventive intervention programs through nutrition screenings and education, as well as other health-related and social support services (Millen et al., 2002). The Elderly Nutrition Program is the largest U.S. community nutrition program for older adults, serving over 3 million meals daily across the nation, and more than 38,000 Georgians in FY 1999 (GA-DHR, 2002). An Executive Summary of Title III programs reported significant health problems within this population (Millen et al., 2002, Ponza et al., 1996). Many of these health problems, such as cardiovascular disease, hypertension, diabetes mellitus, and obesity, are related to poor nutrition and physical activity, and therefore can be potentially lessened by nutrition and physical activity interventions.

Prior research in the Department of Foods and Nutrition at the University of Georgia has shown the high-risk status of many Elderly Nutrition Program participants in northeast Georgia, providing a snapshot of the probable characteristics of Elderly Nutrition Program participants across the state of Georgia. These studies found that more

than 50 percent of participants were at high nutritional risk (according to NSI scores), and that more than 30 percent were obese, had self-reported diabetes or poor glucose control, and were hypertensive (Accettura, 2000; Brackett, 1999). These results indicate that this population is at great nutritional risk, as well as increased risk for poor health overall, and could benefit greatly from nutrition intervention programs.

While documentation is lacking on effective nutrition education and physical activity interventions in older adults, data from national sources (Millen et al., 2002; Ponza et al., 1996) and from within Georgia (Accettura, 2000; Aspinwall, 2001; Brackett, 1999) indicate that participants in Elderly Nutrition Programs are at high nutrition risk and have impairments in Activities of Daily Living. Thus, there is great need to develop, implement, and evaluate nutrition and health education programs based on gains in knowledge and their resulting behavior changes. The goal of this study was to evaluate the impact of a nutrition education curriculum and balance exercise intervention program designed to enhance knowledge about nutrition and fitness and to improve behaviors related to diet, physical activity, and overall health and well-being.

Methods

Institutional Review Boards on Human Subjects of the University of Georgia and the Georgia Department of Human Resources approved all procedures and assessment tools. The overall sequence of the study began with staff training, followed by recruitment of participants, obtaining informed consent, and administration of the pre-test consisting of a questionnaire and two fitness batteries. The pre-test phase took place over approximately a four to eight week time period. The second phase consisted of the approximate six-month long intervention with the nutrition education and balance

exercise program, and the sequence ended with the last phase, which included post-testing. Staff received training on all procedures from the Department of Foods and Nutrition at the University of Georgia.

The Senior Center directors, county extension agents, health educators, and Area Agency on Aging staff aided in recruiting participants, scheduling interviews, and reminding participants of the days they were to participate. Depending on the particular site, one or more of these individuals were responsible for conducting the pre- and post-tests and for disseminating the nutrition education curriculum. University of Georgia staff members were available by phone to answer any questions or problems throughout the study. The only inclusion criteria were age 60 or older and receipt of congregate meals provided by the Georgia Elderly Nutrition Program. All interested persons were given an oral description of the study including the requirements, procedures, and benefits of participation; participants provided written informed consent. The participants were informed of their right to withdraw from the study at anytime with no detrimental effects on the services they received from their ENP. Approximately 655 men and women over the age of 60 were recruited from 28 counties representing the 12 Planning Service Areas across the state of Georgia. During the pre- and post-tests, participants answered questions pertaining to their diet, health, physical activity, and lifestyle. Following the questionnaire, a short assessment of the participants' fitness level was obtained using the Established Populations for Epidemiologic Studies of the Elderly (EPESE) short battery form (Guralnik et al., 1994) and the Fullerton Functional Fitness Test for Older Adults (Rikli and Jones, 1999).

Speaker/Leader Questionnaires were given to participating educators before and after the implementation of the nutrition education and exercise program. These questionnaires include items about their training, employment, behaviors and opinions on health, food, and physical activity.

The nutrition education and physical activity intervention program was called “Take Charge of Your Health Active Older Adult Speaker’s Kit and Placemat Leg Exercises.” These materials were developed by the Georgia Division of Aging Services and Wellness, Inc. and are available commercially from Wellness, Inc. (Duluth, GA). This nutrition education program focuses on correcting risk factors for poor nutrition in older adults and facilitating the voluntary adoption of eating and other nutrition related behaviors that promote health and well being in older adults. The key themes of this curriculum focus on the three Take Charge of Your Health campaign messages: Take 5 a Day, Take Down Fat, and Take Action, that were established by the Georgia Coalition for Physical Activity and Nutrition (G-PAN, 2002). The curriculum also followed the principles of the USDA’s Food Guide Pyramid and Dietary Guidelines (USDA, 2000). The 12 lessons include topics such as heart disease and high blood pressure, calcium and osteoporosis, diabetes, and nutrition and cancer prevention. The leg exercises included toe raises, side leg lifts, leg curls, knee raises, and straight leg extensions. Modifications for those in wheelchairs, or those otherwise unable to stand, were also included. These exercises were graphically shown in photographs on an 11"x 15" laminated placemat to help encourage participation and visual cues (G-PAN, 2002). Classes were given 1 to 2 times per month and participants were encouraged to perform the leg exercises at home or at the Senior Center on a daily basis.

Nutrition and Fitness Assessments

Dietary intake of fruit and vegetable consumption of participants, for both the pre- and post-test questionnaires, was assessed using 6 questions taken from the Behavioral Risk Factor Surveillance System (BRFSS, 1999). The BRFSS is a state-based surveillance system, administered in collaboration with the Centers for Disease Control and Prevention. Information from the Behavioral Risk Factors Survey is used to track trends in behavior changes among the population, determine priority health issues and develop plans to address them, and to monitor the effectiveness of interventions. These questions assess the frequency of consumption of certain fruit and vegetable groups according to daily, weekly, monthly, or yearly time frames. The total fruit and vegetable consumption was calculated by summing the frequency of consumption of the six items from the BRFSS food-frequency instrument. Knowledge and behavior questions related to dietary intake, food behaviors, and exercise/physical activity was addressed by selected questions from the BRFSS. Other questions addressed milk consumption, fat knowledge, and label reading and were adapted from Elbon (1998).

Functional ability was assessed using the Established Populations for Epidemiologic Studies of the Elderly (EPSE) short battery (Guralnik et al., 1994). This tool was developed for assessing mobility in older adults by measuring balance, strength, and gait speed through such tasks as standing balance, chair stands, and an 8-foot walk. The Fullerton Functional Fitness Test for Older Adults (Rikli and Jones, 1999) was also used to test the functional ability of program participants. This test battery was designed to obtain normative data regarding physical and functional performance of community-dwelling older adults. This test also identified criterion-reference standards needed to

maintain the ability to perform ‘desired activity goals.’ There are six components to the test, each reflecting a physical parameter of functional fitness and activities of daily living. The tests included in this battery are based on the guidelines established by the American College of Sports Medicine and are safe for the majority of community-dwelling older adults without prior medical screening; however, we did not use the 6-minute walk test because of concerns about obtaining approval from the institutional review boards and having space to perform this test at the various senior centers.

Statistical Analysis

The data were analyzed using the Statistical Analysis System (Version 8e; SAS Institute, Cary, NC). To ensure accuracy, all data was entered twice and a comparison was generated to detect any discrepancies before the analyses were performed. Data from the pre- and post-tests were compared using paired T-tests and Chi-square analyses to determine if any changes were of statistical significance ($p < 0.05$). Quantitative and qualitative information from open-ended questions was used to assess participant and educator satisfaction with the program (See Appendix, p. 67).

Results

All participants were enrolled in Elderly Nutrition Programs in one of 28 counties across Georgia. Six hundred and sixty-one participants enrolled in the study (mean age 76, 17% men, 83% women, 65% white, 35% African American, and less than 1% Hispanic, Asian, or other) (See Appendix, p. 57) and 501 participants completed both the pre- and post-test measures (mean age 76, 17% men, 83% women, 65% Caucasian, 35% African American). A discussion of the similarities and differences of participants and non-participants can be found in the Appendix (p. 56).

Table 1 shows characteristics of the sample at baseline and describes differences in men and women, African Americans and Caucasians, and those who are younger or older than 80 years of age. This sample had many risks for poor nutrition and poor physical activity such as lack of knowledge (only 33-56% correct) for number of servings of fruits and vegetables to eat daily, type of fat that increases risk of heart disease, and recommendation of 30 minutes of physical activity most days.

Women were about twice as likely as men to know that 5 servings of fruits and vegetables are recommended daily ($p = 0.03$), to read nutrition labels ($p = 0.04$), and to know that saturated fat increases the risk of heart disease ($p = 0.04$), while men drank more milk (mean, $p = 0.01$) and could walk farther ($p = 0.0003$). There were many differences between Caucasians and African Americans. For example, compared to Caucasians, African Americans rated their general health poorer (mean, $p = 0.02$), placed less importance on being active ($p = 0.02$), drank less milk (mean, $p = 0.003$), and were less likely to report trying to eat fewer high fat or cholesterol foods ($p = 0.0004$), but were more likely to drink fruit juice ($p = 0.04$) and steam or boil their vegetables ($p = 0.04$). Overall, African Americans scored lower on knowledge questions ($p = 0.0001$), and were more likely to report barriers to physical activity. Participants 80 years or older consumed more fruit juice ($p = 0.05$), higher-fat milk ($p = 0.002$), more fruit ($p = 0.04$), and more carrots ($p = 0.05$) than those less than 80 years old. Older participants were also less likely to participate in physical activity ($p = 0.03$) and to know the recommendation for 30 minutes of physical activity most days of the week ($p = 0.03$).

Pre- and post-test comparisons of participants are shown in Table 2 and summarize the effect of the intervention on the outcome measures. Self-reported health

improved from a mean value of 3.07 ± 0.9 to 2.97 ± 1.0 (where 3= good and 2= very good; $p = 0.04$). There was a trend ($p = 0.07$) for improvement on the importance of being active on one's health, from 1.99 ± 0.6 to 2.05 ± 0.6 (where 1= somewhat important and 2= very important). There was no significant change in the participants' report of health troubles standing in their way of doing things ($p = 0.76$).

Of the six questions examining fruit and vegetable intake, only one was significantly increased. The mean servings per day of vegetables not including carrots, potatoes, or salad increased from 1.63 ± 0.1 to 1.78 ± 0.1 ($p = 0.02$). Knowledge that five or more servings of fruits and vegetables should be consumed each day rose from 34 to 64% ($p = 0.0001$). Cooking methods for vegetables did not significantly change, with steaming or boiling being the method of choice by 96% at pre test and 95% at post test. Mean daily milk consumption was also found to have a statistically significant improvement (1.29 ± 0.9 vs. 1.37 ± 0.9 , $p = 0.05$). The type of milk consumed improved, although not significantly ($p = 0.07$), from 66% of participants drinking 2%, 0.5-1%, or skim milk at pre test to 73% at post test.

Participants reported an increase in behaviors that reduce the risk of developing heart disease or stroke. Eating fewer high fat or high cholesterol foods improved from 74% to 85% at post testing ($p = 0.0001$) and they also reported exercising more (73% vs. 86%, $p = 0.0001$). A significant change was seen in the cooking method of meat, chicken, or fish preparation ($p = 0.02$) with more people switching from frying to broiling and baking. A behavior change was seen in the number of participants who read nutrition labels, increasing from 58 to 66% ($p = 0.01$). Knowledge regarding fat and heart disease

improved from 55 to 77% of participants knowing saturated fat increases risk at post test ($p = 0.0001$).

Questions assessing physical activity showed many improvements. Participants who participated in any type of physical activity in the past month increased from 82 to 87% ($p = 0.03$). Those who performed the balance exercises in the last month and week increased from 54 to 88% and 55 to 82%, respectively ($p = 0.0001$). Knowledge that 30 minutes of physical activity should be done most days of the week significantly improved from 53 to 68% ($p = 0.0001$). There was a trend for participants to report that the mean number of blocks they could walk without stopping improved after the intervention (2.49 ± 1.5 vs. 2.59 ± 1.5 , $p = 0.10$). Participants who reported being active most days of the week increased from 80 to 88% after completion of the intervention ($p = 0.01$). In addition, the following three barriers to physical activity significantly decreased by two- to three-fold ($p = 0.0001$). Those who reported not having time to be active decreased from 16 to 5%, not liking to be active decreased from 18% to 9%, and feeling it was not safe to be physically active decreased from 15% to 5%. There was no significant change in those reporting a health condition that keeps them from being active ($p = 0.09$) or that it costs too much to be active ($p = 0.56$).

The EPESE test battery mean score significantly improved from 8.0 ± 2.7 at pre-test to 8.3 ± 2.9 at post-test ($p = 0.01$). The functional categories of low, average, and high function also showed a trend toward improvement. The percentage of participants in the low category remained the same at 17% pre- and post-test, while the average category decreased from 52% to 42% and the high category increased from 32% to 42%

($X^2 = 5.79$, $p = 0.055$). All measures of the Fullerton Functional Fitness test improved ($p < 0.005$). The number of chair stands performed in 30 seconds increased from 10.8 ± 3.2 to 11.3 ± 4.0 , and the number of arm curls performed in 30 seconds also increased from 13.9 ± 4.4 to 15.9 ± 5.3 . Flexibility measures increased with the distance (inches) short of touching toes in the Sit-and-Reach and the distance (inches) short of touching fingers in the Back Scratch decreasing from -1.3 ± 3.9 to -0.5 ± 3.7 and -4.8 ± 5.0 to -3.8 ± 4.1 respectively. Walking speed, as assessed by the 8-Foot-Up-and-Go, also showed an improvement ($p = 0.001$), with participants' time decreasing from 9.8 ± 3.7 to 9.1 ± 4.6 seconds.

Discussion

At the national level it is recommended that facilities and programs with Elderly Nutrition Programs are ideal settings for nutrition and health promotion programs in the older adult population (Millen et al., 2002). Most research on Elderly Nutrition Program clients is focused on documenting poor nutritional status and nutritional risk factors (Millen et al., 2002). The evaluation of combined nutrition and physical activity interventions targeted to older adults in the Elderly Nutrition Programs in the Southeast United States is lacking. Therefore, this evaluation is of great value for both the well-being of the older adults served and for the state in its quest to provide nutrition and health promotion activities and services for this population. This nutrition and health promotion program was successful and the major outcomes were: 1) positive changes in knowledge related to nutrition and physical activity, 2) improvements in some health behaviors related to diet and physical activity, and 3) decreases in possible barriers to

physical activity. Of the 31 items assessed, 18 resulted in statistically significant improvements ($p < 0.05$).

The underlying messages for this program were from the Georgia Coalition for Physical Activity and Nutrition (G-PAN, 2002) which emphasizes increasing physical activity, increasing fruit and vegetable consumption, and decreasing dietary fat. Each of the three key areas of the Take Charge of Your Health campaign message showed statistically significant improvements, especially in the knowledge of health promoting behaviors ($p = 0.0001$). The percentage of those who knew the recommendation for five servings of fruits and vegetables each day nearly doubled, from 34 to 64% after the intervention. Knowledge relating fat intake, specifically saturated fat, and heart disease increased from 55% at pre test to 77% after the program. The recommendation for at least 30 minutes of physical activity most days of the week was known by 68% of participants upon completion of the intervention program versus 53% prior to the program. Knowledge of appropriate health behaviors is only one step in improving health-related behavior. Krinke (2001) notes that the dissemination of nutrition information is only part of the equation, and that skill development and increases in instructional knowledge are almost always necessary to produce behavior changes.

While there were gains in knowledge, not all of these areas resulted in corresponding improvements in behavior. For example, although fruit and vegetable knowledge markedly improved, it did not result in an increase in self-reported intake for most categories of fruits and vegetables. The one category that showed a statistically significant improvement, the servings per day of vegetables excluding carrots, potatoes, and salad, had a mean improvement of only 0.15 servings per day. Others have reported

similar changes in fruit and vegetable intake following community-based interventions, as reviewed by Ciliska et al. (2000). Cohen et al. (1998) found that perceived barriers to fruit and vegetable intake increased with decreasing income and education and were related to lower consumption of fruits and vegetables. The results of this evaluation highlight the need to target and address the perceived barriers to fruit and vegetable intake in this population. Perhaps incorporating this information will result in a decrease in perceived barriers and an increase in intake, similar to that seen in the results of barriers to physical activity, which will be addressed shortly. Knowledge about fat and the need to decrease dietary intake did result in many positive behavior changes. There were improvements ranging from 3 to 11 percentage points in the number of participants who reported they ate fewer high fat and high cholesterol foods, were less likely to fry meat, chicken, or fish, read nutrition labels, or switched to a lower fat milk. In addition, there was a 13 to 34 percentage points increase in the three questions assessing physical activity. These findings indicate that this sample of older adults can and did improve their nutrition and physical activity behaviors. Although we were unable to find a similar study in Elderly Nutrition Program clients, our findings are similar to those reported in other samples. For example, Goldberg et al. (1990) found that many older adults reported making modifications in their diet to reduce risk factors associated with chronic diseases. Hackman and Wagner (1990) also reported improved intake in targeted foods, such as low-fat dairy foods and fruits and vegetables, after participation in an educational community gardening project.

The other key area where improvements were made was that of perceived barriers to physical activity. This intervention was successful in addressing and dispelling some

of the myths and misconceptions associated with perceptions of barriers to physical activity. Three of the six barriers addressed, time constraints, not liking to be active, and safety concerns, showed statistically significant improvements ($p < 0.0001$) and led to an increase in the percentage of participants who reported being active on most days of the week (80 vs. 88%, $p = 0.01$). There was also a non-significant decrease in those who reported having a health condition that kept them from being active. At both the pre and post test, less than 2% felt that cost was a barrier to exercise and only 3% felt that its too late to improve ones health. King (2001) suggests that effective interactions for promoting regular physical activity in older adults are dependent on gaining an understanding of the factors that influence activity, and then taking steps to address these issues. Together these positive improvements suggest that these older adults could make even further improvements in their physical activity because of a decrease in their perceived barriers.

Results from the two fitness batteries showed significant improvements in each of the components. The EPESE not only resulted in significant mean score improvements, but also showed a trend for those participants in the average category at pre-test to move up into the high functioning category at post-test. The percentage of participants who fell into the low category remained the same, indicating a possible threshold for maintaining and improving functional ability. The mean score for our participants was 8.0, which is higher than the mean score of 7.1 reported by Guralnik et al. (1994) in a population of older adults 71 years of age and older and living in the community. The Fullerton Functional Fitness test also showed significant improvements in each of the test items. This improvement was encouraging as baseline scores for the majority of participants fell

below the 50% reference standard for all test items. In addition, all scores for the 8-Foot-Up-and-Go fell below the 25th percentile normative value and many age groups of African American men and women also fell below the 25th percentile. The improvements seen at post test indicate that older adults who are in the lower range of functional ability, as compared to normative data, are still capable of making improvements and thus reducing their risk for declining functional ability. This data further strengthens the case for continued physical activity in older adults.

This study had some limitations. Self-reported dietary intake is difficult to assess in this population, due to factors such as low literacy and education levels, low socioeconomic status, age-related declines in sensory functions such as hearing and sight, and possible declines in memory and cognitive functioning. While efforts were made to modify the curriculum to meet the varying educational levels of participants, further adaptations remain necessary in order to facilitate the most effective teaching and learning methods for this population. Secondly, the coordination of a large statewide program with numerous people who have varied experience in an applied research setting may have affected data collection. Providing training in data collection methods for staff at all sites involved in the intervention minimized this potential limitation. The educators consisted mainly of Area Agency on Aging staff, including Registered Dietitians, nurses, county extension agents, fitness instructors and health educators, as well as Senior Center directors, but not all of the educators may have had formal training in both nutrition and physical activity. This potential barrier was minimized by providing training on the use of the curriculum, as well as access to professional staff from the Division of Aging Services, the University of Georgia Department of Foods and Nutrition, and Wellness,

Inc. who were available to answer any questions. Finally, this was the first state-wide attempt to evaluate functional status by collecting direct measures of fitness using well-validated methods designed specifically for assessment of older adults, such as the Fullerton Functional Fitness Test for Older Adults (Rikli and Jones, 1999) and the Established Populations for Epidemiologic Studies of the Elderly (Guralink et al., 1994). In the future additional training should be conducted before these measures are used, because we eliminated 15.8% of the data for the 8-foot-Up-and-Go due to our concerns about reliability.

There are many implications of the findings of this study. First and foremost, this population of older adults is interested in nutrition and physical activity and can make knowledge and behavior changes that may lead to benefits in their health and quality of life. Qualitative information from open-ended questions was used to assess participant satisfaction with the program. Some of the most common responses include, “program makes me aware of my eating behaviors and what I’m supposed to do,” “improved my balance, walking, and flexibility,” and “made me feel better.” Evaluations from the Speaker/Leader Questionnaire indicate that 75% of educators strongly agreed that they would recommend the curriculum to colleagues working with older adults, and 81% strongly agreed that the curriculum enabled them to provide a better quality of service to Senior Center participants.

While the program was successful, there is still room for improvements, especially in the area of facilitating behavior changes related to diet. National public policy, such as Healthy People 2010, has emphasized the role of nutrition education and physical activity in maintaining health in people of all ages (US DHHS, 2000). Therefore

effective nutrition education and physical activity intervention strategies are essential for improving health, nutrition, and fitness in the older population. These reasons, in combination with the documented success of this program, support the continuation and expansion of nutrition education and physical activity intervention programs to other older adults.

Acknowledgements

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Table 1. Baseline Nutrition, Health, and Fitness Characteristics of Elderly Nutrition Program Participants

| <i>Description</i> | <i>n</i> | <i>Total</i> | <i>Men</i> | <i>Women</i> | <i>P value</i> | <i>Caucasian</i> | <i>African American</i> | <i>P value</i> | <i>< 80 y</i> | <i>≥ 80 y</i> | <i>P value</i> |
|---|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| Planning Service Area | | % | % (n) | % (n) | | % (n) | % (n) | | % (n) | % (n) | |
| | | | 16 (81) | 84 (412) | | 65 (317) | 35 (172) | | 65 (321) | 35 (174) | |
| | | | % | % | | % | % | | % | % | |
| 1 | 43 | 9 | 30 | 70 | | 81 | 19 | | 65 | 35 | |
| 2 | 35 | 7 | 14 | 86 | | 100 | 0 | | 66 | 34 | |
| 3 | 31 | 6 | 4 | 96 | | 0 | 100 | | 74 | 26 | |
| 4 | 33 | 7 | 6 | 94 | | 82 | 18 | | 81 | 19 | |
| 5 | 84 | 17 | 15 | 85 | | 70 | 30 | | 61 | 39 | |
| 6 | 36 | 7 | 22 | 78 | | 50 | 50 | | 58 | 42 | |
| 7 | 34 | 7 | 12 | 88 | | 41 | 59 | | 53 | 47 | |
| 8 | 42 | 8 | 12 | 88 | | 27 | 73 | | 67 | 33 | |
| 9 | 50 | 10 | 18 | 82 | | 84 | 16 | | 66 | 34 | |
| 10 | 57 | 11 | 9 | 91 | | 85 | 15 | | 61 | 39 | |
| 11 | 35 | 7 | 37 | 63 | | 74 | 26 | | 69 | 31 | |
| 12 | 20 | 4 | 15 | 85 | | 21 | 79 | | 70 | 30 | |
| Would you say that in general your health is: | | % | % | % | | % | % | | % | % | |
| Excellent = 1 | 30 | 6 | 10 | 5 | 0.37 | 7 | 4 | 0.15 | 6 | 6 | 0.052 |
| Very good = 2 | 88 | 18 | 12 | 19 | | 19 | 16 | | 14 | 24 | |
| Good = 3 | 217 | 44 | 46 | 44 | | 46 | 41 | | 48 | 36 | |
| Fair = 4 | 142 | 29 | 26 | 28 | | 25 | 34 | | 28 | 29 | |
| Poor = 5 | 20 | 4 | 5 | 4 | | 3 | 5 | | 4 | 4 | |
| Means ± SD | 497 | 3.1± 0.9 | 3.0± 1.0 | 3.1± 0.9 | 0.84 | 3.0± 0.9 | 3.2± 0.9 | 0.02 | 3.1± 0.9 | 3.0± 1.0 | 0.26 |

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|---|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| How much do your health troubles stand in your way (of doing things)? | | % | % | % | | % | % | | % | % | |
| Not at all = 0 | 180 | 36 | 36 | 36 | 0.72 | 38 | 34 | 0.35 | 36 | 37 | 0.95 |
| A little = 1 | 237 | 48 | 45 | 48 | | 46 | 52 | | 48 | 47 | |
| A great deal = 2 | 81 | 16 | 19 | 15 | | 17 | 14 | | 17 | 16 | |
| How important is it to your health to be active all or most days of the week? | | % | % | % | | % | % | | % | % | |
| Not at all = 0 | 8 | 2 | 1 | 2 | 0.76 | 1 | 2 | 0.002 | 1 | 2 | 0.77 |
| Somewhat = 1 | 80 | 16 | 16 | 16 | | 12 | 24 | | 16 | 17 | |
| Very = 2 | 315 | 64 | 60 | 64 | | 64 | 62 | | 65 | 61 | |
| Extremely = 3 | 92 | 19 | 23 | 18 | | 22 | 12 | | 19 | 19 | |
| How often did you drink fruit juices such as orange, grapefruit, or tomato? (serving/d) | | | | | | | | | | | |
| Means ± SD | 481 | 0.9± 1.1 | 0.8± 1.0 | 0.9± 1.1 | 0.47 | 0.8± 1.0 | 1.1± 1.2 | 0.04 | 0.8± 0.9 | 1.1± 1.3 | 0.05 |
| Not counting juice, how often did you eat fruit? (serving/d) | | | | | | | | | | | |
| Means ± SD | 482 | 1.1± 1.2 | 1.0± 1.0 | 1.2± 1.3 | 0.12 | 1.1± 1.2 | 1.1± 1.3 | 0.85 | 1.0± 1.1 | 1.3± 1.5 | 0.04 |
| How often did you eat green salad? (serving/d) | | | | | | | | | | | |
| Means ± SD | 481 | 0.4± 0.9 | 0.5± 1.7 | 0.4± 0.6 | 0.54 | 0.5± 1.0 | 0.4± 0.5 | 0.38 | 0.4± 1.0 | 0.5± 0.7 | 0.62 |

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|--|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| How often did you eat potatoes, not including french fries, fried potatoes, or potato chips? (serving/d) | | | | | | | | | | | |
| Means ± SD | 483 | 0.4± 0.5 | 0.4± 0.3 | 0.4± 0.5 | 0.99 | 0.4± 0.6 | 0.3± 0.3 | 0.02 | 0.3± 0.5 | 0.4± 0.6 | 0.08 |
| How often did you eat carrots? (serving/d) | | | | | | | | | | | |
| Means ± SD | 480 | 0.3± 0.5 | 0.3± 0.4 | 0.4± 0.6 | 0.25 | 0.3± 0.5 | 0.4± 0.6 | 0.67 | 0.3± 0.5 | 0.4± 0.7 | 0.05 |
| Not counting carrots, potatoes, or salad, how many servings of vegetables did you usually eat? (serving/d) | | | | | | | | | | | |
| Means ± SD | 481 | 1.6± 1.1 | 1.7± 1.2 | 1.6± 1.0 | 0.45 | 1.8± 1.1 | 1.4± 0.9 | 0.0007 | 1.7± 1.1 | 1.6± 0.9 | 0.91 |
| Eat 5 or more servings of fruits and vegetables each day. | | % | % | % | | % | % | | % | % | |
| | 471 | 37 | 36 | 37 | 0.76 | 39 | 33 | 0.22 | 34 | 43 | 0.06 |
| How are your vegetables usually prepared? | | % | % | % | | % | % | | % | % | |
| Fried = 0 | 9 | 2 | 0 | 2 | 0.37 | 2 | 2 | 0.04 | 3 | 1 | 0.38 |
| Steamed/ boiled = 1 | 464 | 94 | 95 | 94 | | 92 | 96 | | 93 | 96 | |
| Uncooked/ raw = 2 | 9 | 2 | 4 | 1 | | 3 | 0 | | 2 | 2 | |
| Fried and other = 3 | 1 | 0 | 0 | 0 | | 0 | 1 | | 0 | 0 | |
| Steamed and raw = 4 | 11 | 2 | 1 | 2 | | 3 | 1 | | 3 | 1 | |

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|--|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| How many servings of fruits & vegetables should people eat each day? | | % | % | % | | % | % | | % | % | |
| 1 | 66 | 14 | 19 | 13 | 0.03 | 14 | 15 | 0.0001 | 12 | 18 | 0.58 |
| 2 | 102 | 22 | 32 | 20 | | 16 | 32 | | 23 | 20 | |
| 3 | 103 | 23 | 25 | 21 | | 21 | 23 | | 22 | 22 | |
| 4 | 43 | 9 | 8 | 9 | | 9 | 8 | | 9 | 8 | |
| 5 or more | 157 | 33 | 16 | 36 | | 40 | 22 | | 34 | 32 | |
| On average, how much milk do you usually drink? | | % | % | % | | % | % | | % | % | |
| 0 cups | 83 | 17 | 10 | 18 | 0.07 | 14 | 21 | 0.03 | 19 | 13 | 0.32 |
| 1 | 230 | 47 | 44 | 48 | | 45 | 52 | | 46 | 49 | |
| 2 | 126 | 26 | 29 | 25 | | 29 | 20 | | 24 | 28 | |
| 3 or more | 50 | 10 | 17 | 9 | | 12 | 7 | | 10 | 9 | |
| Means ± SD | 489 | 1.3± 0.9 | 1.5± 0.9 | 1.3± 0.9 | 0.01 | 1.4± 0.9 | 1.1± 0.8 | 0.003 | 1.3± 0.9 | 1.3± 0.8 | 0.28 |
| What type of milk do you usually drink? | | % | % | % | | % | % | | % | % | |
| Don't drink milk = 0 | 54 | 11 | 10 | 11 | 0.89 | 8 | 15 | 0.002 | 12 | 9 | 0.002 |
| Whole = 1 | 111 | 23 | 20 | 24 | | 22 | 27 | | 19 | 32 | |
| 2 % = 2 | 206 | 42 | 48 | 42 | | 41 | 45 | | 41 | 45 | |
| 0.5-1 % = 3 | 29 | 6 | 6 | 6 | | 7 | 3 | | 7 | 4 | |
| Skim = 4 | 86 | 18 | 16 | 18 | | 21 | 10 | | 21 | 11 | |

Table 1. Baseline Nutrition, Health, and Fitness Characteristics of Elderly Nutrition Program Participants

| <i>Description</i> | <i>n</i> | <i>Total</i> | <i>Men</i> | <i>Women</i> | <i>P value</i> | <i>Caucasian</i> | <i>African American</i> | <i>P value</i> | <i>< 80 y</i> | <i>≥ 80 y</i> | <i>P value</i> |
|--|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| To lower your risk of developing heart disease or stroke, are you eating fewer high fat or high cholesterol foods? | | % | % | % | | % | % | | % | % | |
| Yes = 1 | 371 | 74 | 68 | 76 | 0.13 | 80 | 64 | 0.0004 | 77 | 70 | 0.11 |
| No = 2 | 89 | 18 | 26 | 16 | | 14 | 25 | | 15 | 23 | |
| Don't know = 3 | 89 | 8 | 6 | 8 | | 6 | 11 | | 8 | 7 | |
| To lower your risk of developing heart disease or stroke, are you exercising more? | | % | % | % | | % | % | | % | % | |
| Yes = 1 | 354 | 73 | 75 | 73 | 0.78 | 74 | 73 | 0.86 | 73 | 73 | 0.89 |
| No = 2 | 132 | 27 | 25 | 27 | | 26 | 27 | | 27 | 27 | |
| How is your meat, chicken, or fish usually prepared? | | % | % | % | | % | % | | % | % | |
| Fried = 0 | 99 | 20 | 38 | 17 | 0.0003 | 20 | 20 | 0.48 | 19 | 22 | 0.09 |
| Broiled/ grilled = 1 | 177 | 36 | 29 | 37 | | 37 | 32 | | 36 | 36 | |
| Baked = 2 | 201 | 41 | 33 | 43 | | 39 | 46 | | 41 | 41 | |
| Broiled and Baked = 4 | 16 | 3 | 1 | 4 | | 4 | 2 | | 5 | 1 | |
| I read the nutrition labels on food packages before I buy. | | % | % | % | | % | % | | % | % | |
| No = 0 | 208 | 42 | 53 | 40 | 0.04 | 44 | 41 | 0.64 | 40 | 47 | 0.13 |
| Yes = 1 | 286 | 58 | 47 | 60 | | 56 | 59 | | 60 | 53 | |

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|---|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| What kind of fat increases the risk of heart disease? | | % | % | % | | % | % | | % | % | |
| Saturated fat = 0 | 274 | 56 | 42 | 58 | 0.004 | 69 | 30 | .0001 | 57 | 51 | 0.27 |
| Unsaturated fat = 1 | 40 | 8 | 5 | 9 | | 5 | 14 | | 7 | 11 | |
| Don't know = 2 | 179 | 36 | 53 | 33 | | 26 | 56 | | 36 | 38 | |
| How many blocks can you walk without stopping? (1 block = 1/8 mile) | | % | % | % | | % | % | | % | % | |
| 0 | 47 | 11 | 8 | 12 | 0.0003 | 12 | 11 | 0.12 | 10 | 13 | 0.27 |
| 1 | 89 | 21 | 8 | 24 | | 19 | 25 | | 20 | 25 | |
| 2 | 64 | 15 | 15 | 16 | | 14 | 17 | | 14 | 18 | |
| 3 | 47 | 11 | 5 | 12 | | 10 | 14 | | 12 | 10 | |
| 4 or more blocks | 172 | 41 | 63 | 36 | | 45 | 33 | | 44 | 35 | |
| Means ± SD | 419 | 2.5± 1.5 | 3.1± 1.4 | 2.4± 1.5 | 0.0002 | 2.6± 1.5 | 2.3± 1.4 | 0.11 | 2.6± 1.5 | 2.3± 1.5 | 0.05 |
| During the past <u>month</u> , did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise? | | % | % | % | | % | % | | % | % | |
| No = 0 | 86 | 18 | 15 | 18 | 0.52 | 18 | 18 | 0.80 | 15 | 23 | 0.03 |
| Yes = 1 | 401 | 82 | 85 | 82 | | 82 | 82 | | 85 | 77 | |

Table 1. Baseline Nutrition, Health, and Fitness Characteristics of Elderly Nutrition Program Participants

| <i>Description</i> | <i>n</i> | <i>Total</i> | <i>Men</i> | <i>Women</i> | <i>P value</i> | <i>Caucasian</i> | <i>African American</i> | <i>P value</i> | <i>< 80 y</i> | <i>≥ 80 y</i> | <i>P value</i> |
|---|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| During the past <u>week</u> , did you do leg exercises (as shown in this picture)? | | % | % | % | | % | % | | % | % | |
| No = 0 | 225 | 46 | 52 | 45 | 0.20 | 50 | 39 | 0.03 | 47 | 44 | 0.52 |
| Yes = 1 | 263 | 54 | 48 | 55 | | 50 | 61 | | 53 | 56 | |
| During the past <u>month</u> , did you do leg exercises (as shown in this picture)? | | % | % | % | | % | % | | % | % | |
| No = 0 | 224 | 46 | 58 | 44 | 0.04 | 50 | 42 | 0.11 | 47 | 46 | 0.85 |
| Yes = 1 | 260 | 54 | 42 | 56 | | 50 | 58 | | 53 | 54 | |
| How much physical activity <u>should</u> people do most days of the week? | | % | % | % | | % | % | | % | % | |
| 0 minutes = 0 | 0 | 0 | 0 | 0 | 0.008 | 0 | 0 | .0001 | 0 | 0 | 0.18 |
| 1-5 minutes = 1 | 16 | 3 | 0 | 4 | | 2 | 6 | | 3 | 3 | |
| 6-10 minutes = 2 | 39 | 8 | 3 | 10 | | 6 | 13 | | 8 | 9 | |
| 11-15 minutes = 3 | 65 | 14 | 12 | 15 | | 11 | 20 | | 13 | 18 | |
| 16-20 minutes = 4 | 69 | 15 | 22 | 13 | | 14 | 14 | | 13 | 20 | |
| 21-25 minutes = 5 | 26 | 6 | 7 | 6 | | 4 | 8 | | 6 | 6 | |
| 26-29 minutes = 6 | 5 | 1 | 4 | 0 | | 2 | 0 | | 1 | 1 | |
| 30 or more = 7 | 241 | 52 | 52 | 52 | | 60 | 38 | | 56 | 44 | |
| Means ± SD | 461 | 5.2± 2.0 | 5.5± 1.7 | 5.2± 2.1 | 0.10 | 5.6± 1.9 | 4.6± 2.1 | .0001 | 5.4± 2.0 | 4.9± 2.0 | 0.03 |

Table 1. Baseline Nutrition, Health, and Fitness Characteristics of Elderly Nutrition Program Participants

| <i>Description</i> | <i>n</i> | <i>Total</i> | <i>Men</i> | <i>Women</i> | <i>P value</i> | <i>Caucasian</i> | <i>African American</i> | <i>P value</i> | <i>< 80 y</i> | <i>≥ 80 y</i> | <i>P value</i> |
|---|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| Do any of the following keep you from being active on all or most days of the week? | | | | | | | | | | | |
| I already am active on all or most days of the week. | | % | % | % | | % | % | | % | % | |
| No = 0 | 95 | 19 | 18 | 19 | 0.79 | 19 | 19 | 0.96 | 18 | 23 | 0.18 |
| Yes = 1 | 395 | 81 | 82 | 81 | | 81 | 81 | | 82 | 77 | |
| I have a health condition that keeps me from being active. | | % | % | % | | % | % | | % | % | |
| No = 0 | 354 | 73 | 75 | 72 | 0.65 | 73 | 71 | 0.63 | 75 | 69 | 0.18 |
| Yes = 1 | 134 | 27 | 25 | 28 | | 27 | 29 | | 25 | 31 | |
| It costs too much | | % | % | % | | % | % | | % | % | |
| No = 0 | 480 | 99 | 99 | 99 | 0.83 | 99 | 98 | 0.25 | 98 | 100 | 0.10 |
| Yes = 1 | 5 | 1 | 1 | 1 | | 1 | 2 | | 2 | 0 | |
| I don't have time. | | % | % | % | | % | % | | % | % | |
| No = 0 | 406 | 84 | 82 | 84 | 0.63 | 88 | 77 | 0.004 | 86 | 81 | 0.21 |
| Yes = 1 | 78 | 16 | 18 | 16 | | 12 | 23 | | 14 | 19 | |
| I don't like to. | | % | % | % | | % | % | | % | % | |
| No = 0 | 393 | 82 | 85 | 81 | 0.45 | 86 | 74 | 0.003 | 83 | 79 | 0.29 |
| Yes = 1 | 89 | 18 | 15 | 19 | | 14 | 26 | | 17 | 21 | |
| It's too late to improve my health. | | % | % | % | | % | % | | % | % | |
| No = 0 | 468 | 96 | 95 | 97 | 0.43 | 97 | 96 | 0.61 | 97 | 95 | 0.12 |
| Yes = 1 | 17 | 4 | 5 | 3 | | 3 | 4 | | 3 | 5 | |

Table 1. Baseline Nutrition, Health, and Fitness Characteristics of Elderly Nutrition Program Participants

| <i>Description</i> | <i>n</i> | <i>Total</i> | <i>Men</i> | <i>Women</i> | <i>P value</i> | <i>Caucasian</i> | <i>African American</i> | <i>P value</i> | <i>< 80 y</i> | <i>≥ 80 y</i> | <i>P value</i> |
|---|----------|--------------|------------|--------------|----------------|------------------|-------------------------|----------------|------------------|---------------|----------------|
| It's not safe. | | % | % | % | | % | % | | % | % | |
| No = 0 | 411 | 85 | 83 | 86 | 0.69 | 89 | 78 | 0.0008 | 86 | 83 | 0.37 |
| Yes = 1 | 72 | 15 | 17 | 14 | | 11 | 22 | | 14 | 17 | |
| Exercise Batteries: | | | | | | | | | | | |
| EPESE summary score, Means ± SD | 333 | 8.0± 2.7 | 8.4± 2.7 | 7.9± 2.7 | 0.27 | 8.1± 2.8 | 7.7± 2.6 | 0.28 | 8.3± 2.7 | 7.4± 2.6 | 0.003 |
| EPESE functional category score | | % | % | % | | % | % | | % | % | |
| Category 1 (low: 0 to 5) | 58 | 17 | 14 | 18 | 0.68 | 17 | 19 | 0.11 | 15 | 22 | 0.003 |
| Category 2 (average: 6 to 9) | 168 | 51 | 51 | 51 | | 48 | 56 | | 46 | 58 | |
| Category 3 (high: 10 to 12) | 107 | 32 | 35 | 31 | | 35 | 24 | | 39 | 20 | |
| Fullerton Functional Fitness Test | | | | | | | | | | | |
| Chair stands (number in 30 sec.) Means ± SD | 394 | 10.8± 3.1 | 10.8± 3.1 | 10.8± 3.1 | 0.99 | 11.2± 3.2 | 10.1± 2.9 | 0.001 | 11.2± 3.1 | 10.6± 3.1 | 0.001 |
| Arm curls (number in 30 sec.) Means ± SD | 470 | 13.9± 4.4 | 15.0± 5.4 | 13.7± 4.1 | 0.07 | 14.6± 4.5 | 12.7± 4.0 | 0.0001 | 14.9± 4.4 | 13.1± 4.2 | 0.004 |
| Sit-and-reach Means ± SD (inches) | 466 | -1.3± 3.9 | -1.6± 4.2 | -1.2± 3.8 | 0.45 | -1.2± 4.0 | -1.3± 3.8 | 0.76 | -1.3± 4.0 | -1.4± 3.9 | 0.72 |
| 8-foot Up-and-Go Means ± SD (sec.) | 422 | 9.8± 3.7 | 9.5± 3.6 | 9.8± 3.7 | 0.60 | 9.5± 3.7 | 10.3± 3.7 | 0.022 | 9.2± 3.5 | 10.7± 3.7 | .0001 |
| Back scratch Means ± SD (inches) | 361 | -4.8± 5.0 | -6.3± 5.5 | -4.5± 4.9 | 0.022 | 3.6± 25.4 | -4.0± 16.0 | 0.001 | -4.7± 4.8 | -4.9± 5.3 | 0.77 |

Table 2. Pre- and Post-Test Comparisons

| <i>Question Description</i> | <i>n</i> | <i>Time 1</i> | <i>Time 2</i> | <i>T-statistic or Chi- Square</i> | <i>P value</i> |
|---|----------|---------------|---------------|---|--------------------|
| Would you say that in general your health is: | | % | % | | |
| Excellent = 1 | 489 | 6 | 8 | 2.74 | 0.60 |
| Very good = 2 | | 18 | 20 | | |
| Good = 3 | | 44 | 43 | | |
| Fair = 4 | | 28 | 25 | | |
| Poor = 5 | | 4 | 4 | | |
| Means ± SD | 489 | 3.07 ± 0.9 | 2.97 ± 1.0 | -2.13 | 0.0337 |
| How much do your health troubles stand in your way (of doing things)? | | % | % | | |
| Not at all = 0 | 486 | 36 | 37 | 0.07 | 0.96 |
| A little = 1 | | 48 | 48 | | |
| A great deal = 2 | | 16 | 15 | | |
| Means ± SD | 486 | 0.80 ± 0.7 | 0.79 ± 0.7 | -0.31 | 0.76 |
| How important is it to your health to be active all or most days of the week? | | % | % | | |
| Not at all = 0 | 487 | 2 | 1 | 3.45 | 0.33 |
| Somewhat = 1 | | 16 | 16 | | |
| Very = 2 | | 63 | 61 | | |
| Extremely = 3 | | 18 | 22 | | |
| Means ± SD | 487 | 1.99 ± 0.6 | 2.05 ± 0.6 | 1.82 | 0.07 |
| How often did you drink fruit juices such as orange, grapefruit, or tomato? (servings/d) | | | | | |
| Means ± SD | 459 | 0.91 ± 1.0 | 0.96 ± 1.0 | 0.75 | 0.46 |
| Not counting juice, how often did you eat fruit? (servings/d) | | | | | |
| Means ± SD | 457 | 1.06 ± 1.1 | 1.09 ± 1.0 | 0.58 | 0.56 |
| How often did you eat green salad? (servings/d) | | | | | |
| Means ± SD | 454 | 0.43 ± 0.9 | 0.39 ± 0.5 | -0.92 | 0.36 |
| How often did you eat potatoes, not including french fries, fried potatoes, or potato chips? (servings/d) | | | | | |
| Means ± SD | 458 | 0.37 ± 0.5 | 0.36 ± 0.3 | -0.63 | 0.53 |
| How often did you eat carrots? (servings/d) | | | | | |
| Means ± SD | 459 | 0.35 ± 0.5 | 0.32 ± 0.4 | -1.10 | 0.27 |

Table 2. Pre- and Post-Test Comparisons

| <i>Question Description</i> | <i>n</i> | <i>Time 1</i> | <i>Time 2</i> | <i>T-statistic or Chi- Square</i> | <i>P value</i> |
|---|----------|---------------|---------------|---|--------------------|
| Not counting carrots, potatoes, or salad, how many servings of vegetables did you usually eat? (servings/d) | | | | | |
| Means ± SD | 458 | 1.63 ± 0.1 | 1.78 ± 0.1 | 2.45 | 0.0148 |
| Total fruit and vegetable intake (servings/d) | | | | | |
| Means ± SD | 431 | 4.73 ± 0.1 | 4.83 ± 0.2 | 0.67 | 0.50 |
| Eat 5 or more servings of fruit and vegetables each day | | % | % | | |
| | 471 | 37 | 37 | 0.02 | 0.89 |
| How are your vegetables usually prepared? | | % | % | | |
| Fried = 0 | 488 | 2 | 3 | 1.89 | 0.39 |
| Steamed/ boiled = 1 | | 96 | 95 | | |
| Uncooked/ raw = 2 | | 2 | 2 | | |
| How many servings of fruits & vegetables <u>should</u> people eat each day? | | % | % | | |
| 0 | 456 | 0 | 0 | 97.32 | 0.0001 |
| 1 | | 14 | 4 | | |
| 2 | | 21 | 9 | | |
| 3 | | 22 | 16 | | |
| 4 | | 9 | 6 | | |
| 5 or more (correct answer) | | 34 | 64 | | |
| On average, how much milk do you usually drink each day? | | % | % | | |
| 0 cups | 481 | 17 | 14 | 2.39 | 0.50 |
| 1 | | 47 | 48 | | |
| 2 | | 26 | 27 | | |
| 3 or more | | 10 | 12 | | |
| Means ± SD | 481 | 1.29 ± 0.9 | 1.37 ± 0.9 | 2.01 | 0.0450 |
| What type of milk do you usually drink? | | % | % | | |
| Don't drink milk = 0 | 476 | 11 | 7 | 8.62 | 0.07 |
| Whole = 1 | | 23 | 21 | | |
| 2 % = 2 | | 42 | 47 | | |
| 0.5-1 % = 3 | | 6 | 8 | | |
| Skim = 4 | | 18 | 18 | | |

Table 2. Pre- and Post-Test Comparisons

| <i>Question Description</i> | <i>n</i> | <i>Time 1</i> | <i>Time 2</i> | <i>T-statistic or Chi- Square</i> | <i>P value</i> |
|---|----------|---------------|---------------|---|--------------------|
| To lower your risk of developing heart disease or stroke, are you eating fewer high fat or high cholesterol foods? | | % | % | | |
| Yes = 1 | 494 | 74 | 85 | 20.00 | 0.0001 |
| No = 2 | | 18 | 11 | | |
| Don't know = 3 | | 8 | 4 | | |
| To lower your risk of developing heart disease or stroke, are you exercising more? | | % | % | | |
| Yes = 1 | 477 | 73 | 86 | 25.39 | 0.0001 |
| No = 2 | | 27 | 14 | | |
| How is your meat, chicken, or fish usually prepared? | | % | % | | |
| Fried = 0 | 486 | 20 | 17 | 9.88 | 0.0196 |
| Broiled/ grilled = 1 | | 36 | 36 | | |
| Baked = 2 | | 41 | 39 | | |
| Broiled and Baked = 4 | | 3 | 8 | | |
| I read the nutrition labels on food packages before I buy. | | % | % | | |
| No = 0 | 487 | 42 | 34 | 6.62 | 0.0101 |
| Yes = 1 | | 58 | 66 | | |
| What kind of fat increases the risk of heart disease? | | % | % | | |
| Saturated fat = 0 | 482 | 55 | 77 | 55.84 | 0.0001 |
| Unsaturated fat = 1 | | 8 | 5 | | |
| Don't know = 2 | | 37 | 17 | | |
| How many blocks can you walk without stopping? (1 block = 1/8 mile) | | % | % | | |
| 0 | 409 | 11 | 10 | 0.90 | 0.92 |
| 1 | | 22 | 20 | | |
| 2 | | 15 | 15 | | |
| 3 | | 11 | 12 | | |
| 4 or more blocks | | 41 | 44 | | |
| Means ± SD | 409 | 2.49 ± 1.5 | 2.59 ± 1.5 | 1.66 | 0.10 |
| During the past <u>month</u> , did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise? | | % | % | | |
| No = 0 | 479 | 18 | 13 | 5.08 | 0.0242 |
| Yes = 1 | | 82 | 87 | | |

Table 2. Pre- and Post-Test Comparisons

| <i>Question Description</i> | <i>n</i> | <i>Time 1</i> | <i>Time 2</i> | <i>T-statistic or Chi- Square</i> | <i>P value</i> |
|---|----------|---------------|---------------|---|--------------------|
| During the past <u>week</u> , did you do leg exercises (as shown in this picture)? | | % | % | | |
| No = 0 | 479 | 45 | 18 | 82.84 | 0.0001 |
| Yes = 1 | | 55 | 82 | | |
| During the past <u>month</u> , did you do leg exercises (as shown in this picture)? | | % | % | | |
| No = 0 | 472 | 46 | 12 | 134.17 | 0.0001 |
| Yes = 1 | | 54 | 88 | | |
| How much physical activity <u>should</u> people do most days of the week? | | % | % | | |
| 1-5 minutes = 1 | 442 | 3 | 3 | 29.07 | 0.0001 |
| 6-10 minutes = 2 | | 8 | 5 | | |
| 11-15 minutes = 3 | | 14 | 7 | | |
| 16-20 minutes = 4 | | 15 | 10 | | |
| 21-25 minutes = 5 | | 6 | 4 | | |
| 26-29 minutes = 6 | | 1 | 2 | | |
| 30 or more = 7 (correct answer) | | 53 | 68 | | |
| I already am active on all or most days of the week. | | % | % | | |
| No = 0 | 477 | 20 | 12 | 10.14 | 0.0014 |
| Yes = 1 | | 80 | 88 | | |
| I have a health condition that keeps me from being active. | | % | % | | |
| No = 0 | 474 | 72 | 77 | 2.94 | 0.09 |
| Yes = 1 | | 28 | 23 | | |
| It costs too much | | % | % | | |
| No = 0 | 467 | 99 | 98 | 0.34 | 0.56 |
| Yes = 1 | | 1 | 2 | | |
| I don't have time. | | % | % | | |
| No = 0 | 466 | 84 | 95 | 27.63 | 0.0001 |
| Yes = 1 | | 16 | 5 | | |
| I don't like to. | | % | % | | |
| No = 0 | 463 | 82 | 91 | 18.03 | 0.0001 |
| Yes = 1 | | 18 | 9 | | |
| It's too late to improve my health. | | % | % | | |
| No = 0 | 468 | 97 | 97 | 0.32 | 0.57 |
| Yes = 1 | | 3 | 3 | | |
| It's not safe. | | % | % | | |
| No = 0 | 463 | 85 | 95 | 25.05 | 0.0001 |
| Yes = 1 | | 15 | 5 | | |

Table 2. Pre- and Post-Test Comparisons

| <i>Question Description</i> | <i>n</i> | <i>Time 1</i> | <i>Time 2</i> | <i>T-statistic or Chi-Square</i> | <i>P value</i> |
|---|----------|---------------|---------------|--|--------------------|
| EPESI summary score Means ± SD | 333 | 8.0± 2.7 | 8.3± 2.9 | 2.59 | 0.01 |
| EPESI functional category scores | | % (n) | % (n) | | |
| Category 1 (low: 0 to 5) | | 17 (58) | 17 (58) | 5.79 | 0.055 |
| Category 2 (average: 6 to 9) | | 51 (168) | 42 (140) | | |
| Category 3 (high: 10 to 12) | | 32 (107) | 41 (135) | | |
| | | | | | |
| Fullerton Functional Fitness Test | | | | | |
| Chair stands (number in 30 seconds) Means ± SD | 394 | 10.8± 3.2 | 11.3± 4.0 | 2.82 | 0.0051 |
| Arm curls (number in 30 seconds) Means ± SD | 470 | 13.9± 4.4 | 15.9± 5.3 | 10.44 | 0.0001 |
| Sit-and-reach Means ± SD (inches) | 466 | -1.3± 3.9 | -0.5± 3.7 | 4.47 | 0.0001 |
| 8-foot Up-and-Go Means ± SD (seconds) | 422 | 9.8± 3.7 | 9.1± 4.6 | -3.47 | 0.0006 |
| Back scratch Means ± SD (inches) | 361 | -4.8± 5.0 | -3.8± 4.1 | 3.96 | 0.0001 |

CHAPTER IV

CONCLUSIONS

The overall objectives of this evaluation were to: 1) determine baseline prevalence of low knowledge and poor behaviors related to dietary intake and physical activity in Elderly Nutrition Program participants in Georgia, 2) determine the impact of the nutrition education curriculum and balance leg exercises on Elderly Nutrition Program participants' nutritional knowledge, dietary intake, physical activity, and functional fitness, 3) determine how well the curriculum's content and materials met the needs of Elderly Nutrition Program participants and educators.

Major Findings

Results from the pre-test (baseline) data indicated that this sample of 501 older adults who participated in Elderly Nutrition Programs across the state of Georgia, had many risks for poor nutrition and poor physical activity. Knowledge that related to the three key themes of the nutrition education curriculum was incorrect for 44 to 67% of participants. In addition, dietary intake of fruits and vegetables was below recommendations, and other health behaviors such as reading nutrition labels and regular physical activity were also low.

The nutrition education and physical activity intervention program yielded many positive results at the conclusion of the post-test. The first of the three major outcomes is the positive changes in knowledge related to nutrition and physical activity that occurred. Each of the three key areas showed statistically significant ($p = 0.0001$) improvements in

respect to the knowledge of these health promoting behaviors. The second finding was improvements in some health behaviors related to diet and physical activity. This was particularly true for those questions that assessed behaviors related to fat intake and physical activity. For instance, there was a three to eleven percent increase in those participants that reported eating fewer high fat and high cholesterol foods, preparing their meats by frying, or switching to lower fat milk. Three questions assessing physical activity also had positive responses with percentage points increasing from 13 to 34. Another important outcome was the significant decreases made in perceived barriers to physical activity. The three barriers that decreased significantly ($p = 0.0001$) were time constraints, not liking to be active, and safety concerns.

Program evaluations from both the participants and educators were collected. This assessment provided feedback as to how well the program meet the needs of the Georgia Elderly Nutrition Program population. The participants were pleased with the program and indicated many benefits they attributed to their involvement. In addition, the educators provided feedback as to the appropriateness of the material and its usability. Overall, the evaluations were positive with most suggestions focusing on ways to better target this population and thus improve the program outcomes.

Implications

The results of this evaluation show that older adults that participate in the Elderly Nutrition Program in Georgia are a responsive population towards nutrition and physical activity programs. This group of older adults is not only interested in learning about diet, physical activity, and other ways to promote optimum health, but also has been shown to incorporate much of these gains in knowledge into daily behavior patterns. While these

results show many improvements, we acknowledge the continued need to target particular behavior changes, such as increasing fruit and vegetable intake, to produce the greatest benefits in overall health and well-being.

There are also modifications that can be made to further the success of this program. This includes curriculum modifications, which are needed to further adapt the lesson information to the appropriate educational level of this population. Using a theoretical model, such as the health belief model (Krinke, 2001), should be used when developing nutrition and physical activity educational programs. Continuing to better target the material and its presentation to the participants will facilitate the most effective teaching and learning methods for this population. Future programs may also consider targeting lessons on one particular topic area, as opposed to many topics. This strategy allows for more thorough development of the topic and more repetition of key concepts, which may help these older adults to implement this new knowledge into their daily lives and make the necessary behavior changes to promote health and improve quality of life. Another area where the program will benefit from modifications is in the training phase. Additional training sessions may need to be included in order to ensure that all staff are competent in collecting quality data. An additional review session may be beneficial before the administration of the post-test in order to re-emphasize quality collection methods. With respect to data analysis and record keeping, staff should be more comprehensively trained on the proper collection and recording of data to ensure maximum benefits of the testing procedure. Staff should remain conscientious of the necessity to properly collect and record data throughout the entire testing procedure, which may span many months. Including these suggestions in planning future

evaluations of this type will greatly maximize the potential for useable outcome data. Future research should focus on targeting behavior changes and improving nutrition, functional fitness, and overall health and well being.

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APPENDIX

Discussion of Participant and Non-Participant Characteristics

There were 655 participants who began the study and 501 completed both the pre- and post-test measures. This left 154 people who did not complete the intervention and/or the post-test phases. As noted in Chapter 3, there were no differences between these two groups for the variables of age, gender, or ethnicity. Of the 38 questions/items evaluated, only five were statistically significant for differences between the participants and non-participants. Compared to participants, the non-participants reported poorer self-rated health (with 3 = good; 3.34 ± 1.0 vs. 3.07 ± 0.9 , $p = 0.002$; $X^2 = 19.89$, $p = 0.0005$), and less importance of being active on their health (1.79 ± 1.7 vs. 1.99 ± 0.6 , $p = 0.004$; $X^2 = 15.09$, $p = 0.002$). Non-participants also reported the ability to walk fewer blocks without stopping ($X^2 = 10.65$, $p = 0.03$) and reported cost as a barrier to being active (4% vs. 1%, $X^2 = 5.44$, $p = 0.02$). Finally, non-participants also scored lower on the EPESE summary score (7.90 ± 2.7 vs. 7.34 ± 2.9 , $X^2 = -1.96$, $p = 0.0506$).

Table 3. Participant and Non-participant Characteristics

| <i>Question Description</i> | <i>Non-Participants</i> | <i>Participants</i> | <i>T-statistic or Chi-Square</i> | <i>P value</i> |
|---|-------------------------|---------------------|----------------------------------|----------------|
| Would you say that in general your health is: | % (n) | % (n) | | |
| Excellent = 1 | 4 (6) | 6 (28) | 19.89 | 0.0005 |
| Very good = 2 | 16 (25) | 18 (89) | | |
| Good = 3 | 36 (55) | 44 (215) | | |
| Fair = 4 | 31 (47) | 28 (137) | | |
| Poor = 5 | 14 (21) | 4 (20) | | |
| Means ± SD | 3.34 ± 1.0 | 3.07 ± 0.9 | 3.10 | 0.002 |
| How much do your health troubles stand in your way (of doing things)? | % (n) | % (n) | | |
| Not at all = 0 | 34 (52) | 36 (176) | 3.85 | 0.15 |
| A little = 1 | 44 (67) | 48 (233) | | |
| A great deal = 2 | 23 (35) | 16 (77) | | |
| Means ± SD | 0.89 ± 0.7 | 0.80 ± 0.7 | 1.43 | 0.15 |
| How important is it to your health to be active all or most days of the week? | % (n) | % (n) | | |
| Not at all = 0 | 4 (6) | 2 (8) | 15.09 | 0.0017 |
| Somewhat = 1 | 29 (44) | 16 (80) | | |
| Very = 2 | 52 (79) | 63 (309) | | |
| Extremely = 3 | 16 (24) | 18 (90) | | |
| Means ± SD | 1.79 ± 1.7 | 1.99 ± 0.6 | -2.93 | 0.0038 |
| How often did you drink fruit juices such as orange, grapefruit, or tomato? (servings/d) | | | | |
| Means ± SD | 1.23 ± 2.3 | 0.89 ± 1.0 | 1.63 | 0.10 |
| Not counting juice, how often did you eat fruit? (servings/d) | | | | |
| Means ± SD | 1.03 ± 1.2 | 1.11 ± 1.3 | -0.64 | 0.52 |
| How often did you eat green salad? (servings/d) | | | | |
| Means ± SD | 0.35 ± 0.4 | 0.43 ± 0.9 | -1.62 | 0.11 |
| How often did you eat potatoes, not including french fries, fried potatoes, or potato chips? (servings/d) | | | | |
| Means ± SD | 0.37 ± 0.3 | 0.38 ± 0.5 | -0.38 | 0.71 |
| How often did you eat carrots? (servings/d) | | | | |
| Means ± SD | 0.29 ± 0.3 | 0.36 ± 0.6 | -1.86 | 0.06 |

Table 3. Participant and Non-participant Characteristics

| <i>Question Description</i> | <i>Non-Participants</i> | <i>Participants</i> | <i>T-statistic or Chi-Square</i> | <i>P value</i> |
|---|-------------------------|---------------------|----------------------------------|----------------|
| Not counting carrots, potatoes, or salad, how many servings of vegetables did you usually eat? (servings/d) | | | | |
| Means \pm SD | 1.61 \pm 1.1 | 1.61 \pm 1.1 | -0.01 | 0.99 |
| Total fruit and vegetable Intake (servings/d) | | | | |
| Means \pm SD | 4.77 \pm 3.4 | 4.72 \pm 2.9 | 0.13 | 0.90 |
| Eat 5 or more servings of fruits and vegetables each day | % (n) | % (n) | | |
| | 32 (48) | 37 (173) | 1.11 | 0.29 |
| How are your vegetables usually prepared? | % (n) | % (n) | | |
| Fried = 0 | 4 (6) | 2 (10) | 7.61 | 0.41 |
| Steamed/ boiled = 1 | 94 (144) | 96 (470) | | |
| Uncooked/ raw = 2 | 2 (3) | 2 (8) | | |
| How many servings of fruits & vegetables <u>should</u> people eat each day? | % (n) | % (n) | | |
| 0 | 0 (0) | 0 (1) | 7.61 | 0.18 |
| 1 | 9 (13) | 14 (63) | | |
| 2 | 18 (26) | 21 (96) | | |
| 3 | 33 (46) | 22 (101) | | |
| 4 | 9 (13) | 9 (41) | | |
| 5 or more (correct answer) | 31 (43) | 34 (154) | | |
| On average, how much milk do you usually drink each day? | % (n) | % (n) | | |
| 0 cups | 11 (16) | 17 (81) | 4.31 | 0.23 |
| 1 | 54 (82) | 47 (227) | | |
| 2 | 25 (37) | 26 (126) | | |
| 3 or more | 11 (16) | 10 (47) | | |
| Means \pm SD | 1.35 \pm 0.8 | 1.29 \pm 0.9 | 0.78 | 0.43 |
| What type of milk do you usually drink? | % (n) | % (n) | | |
| Don't drink milk = 0 | 7 (11) | 11 (53) | 7.24 | 0.12 |
| Whole = 1 | 18 (28) | 23 (109) | | |
| 2 % = 2 | 48 (73) | 42 (202) | | |
| 0.5-1 % = 3 | 3 (5) | 6 (28) | | |
| Skim = 4 | 24 (36) | 18 (84) | | |

Table 3. Participant and Non-participant Characteristics

| <i>Question Description</i> | <i>Non-Participants</i> | <i>Participants</i> | <i>T-statistic or Chi-Square</i> | <i>P value</i> |
|--|-------------------------|---------------------|----------------------------------|----------------|
| To lower your risk of developing heart disease or stroke, are you eating fewer high fat or high cholesterol foods? | % (n) | % (n) | | |
| Yes = 1 | 77 (119) | 74 (366) | 0.81 | 0.67 |
| No = 2 | 15 (23) | 18 (89) | | |
| Don't know = 3 | 8 (12) | 8 (39) | | |
| To lower your risk of developing heart disease or stroke, are you exercising more? | % (n) | % (n) | | |
| Yes = 1 | 74 (112) | 73 (347) | 0.05 | 0.82 |
| No = 2 | 26 (40) | 27 (130) | | |
| How is your meat, chicken, or fish usually prepared? | % (n) | % (n) | | |
| Fried = 0 | 20 (31) | 20 (98) | 0.48 | 0.92 |
| Broiled/ grilled = 1 | 39 (59) | 36 (174) | | |
| Baked = 2 | 38 (58) | 41(198) | | |
| Broiled and Baked = 4 | 3 (5) | 3 (16) | | |
| I read the nutrition labels on food packages before I buy. | % (n) | % (n) | | |
| No = 0 | 40 (61) | 42 (205) | 0.18 | 0.67 |
| Yes = 1 | 60 (91) | 58 (282) | | |
| What kind of fat increases the risk of heart disease? | % (n) | % (n) | | |
| Saturated fat = 0 | 49 (75) | 55 (264) | 3.15 | 0.21 |
| Unsaturated fat = 1 | 6 (10) | 8 (40) | | |
| Don't know = 2 | 45 (69) | 37 (178) | | |
| How many blocks can you walk without stopping? (1 block = 1/8 mile) | % (n) | % (n) | | |
| 0 | 21 (29) | 11 (45) | 10.65 | 0.0308 |
| 1 | 14 (20) | 22 (88) | | |
| 2 | 17 (24) | 15 (63) | | |
| 3 | 10 (14) | 11 (46) | | |
| 4 or more blocks | 38 (53) | 41 (167) | | |
| Means \pm SD | 2.30 \pm 1.6 | 2.49 \pm 1.5 | -1.32 | 0.19 |

Table 3. Participant and Non-participant Characteristics

| <i>Question Description</i> | <i>Non-Participants</i> | <i>Participants</i> | <i>T-statistic or Chi-Square</i> | <i>P value</i> |
|---|-------------------------|---------------------|----------------------------------|----------------|
| During the past <u>month</u> , did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise? | % (n) | % (n) | | |
| No = 0 | 23 (36) | 18 (85) | 2.39 | 0.12 |
| Yes = 1 | 77 (118) | 82 (394) | | |
| During the past <u>week</u> , did you do leg exercises (as shown in this picture)? | % (n) | % (n) | | |
| No = 0 | 41 (62) | 45 (217) | 0.73 | 0.39 |
| Yes = 1 | 59 (88) | 55 (262) | | |
| During the past <u>month</u> , did you do leg exercises (as shown in this picture)? | % (n) | % (n) | | |
| No = 0 | 41 (60) | 46 (216) | 1.24 | 0.26 |
| Yes = 1 | 59 (88) | 54 (256) | | |
| How much physical activity <u>should</u> people do most days of the week? | % (n) | % (n) | | |
| 1-5 minutes = 1 | 4 (6) | 3 (12) | 8.65 | 0.19 |
| 6-10 minutes = 2 | 12 (17) | 8 (36) | | |
| 11-15 minutes = 3 | 20 (29) | 14 (63) | | |
| 16-20 minutes = 4 | 17 (24) | 15 (27) | | |
| 21-25 minutes = 5 | 4 (5) | 6 (26) | | |
| 26-29 minutes = 6 | 1 (1) | 1 (5) | | |
| 30 or more = 7 (correct answer) | 43 (61) | 53 (233) | | |
| I already am active on all or most days of the week. | % (n) | % (n) | | |
| No = 0 | 25 (39) | 20 (94) | 2.33 | 0.13 |
| Yes = 1 | 75 (114) | 80 (383) | | |
| I have a health condition that keeps me from being active. | % (n) | % (n) | | |
| No = 0 | 65 (99) | 72 (343) | 3.13 | 0.08 |
| Yes = 1 | 35 (54) | 28 (132) | | |
| It costs too much | % (n) | % (n) | | |
| No = 0 | 96 (146) | 99 (462) | 5.44 | 0.0197 |
| Yes = 1 | 4 (6) | 1 (5) | | |
| I don't have time. | % (n) | % (n) | | |
| No = 0 | 88 (133) | 84 (393) | 0.91 | 0.34 |
| Yes = 1 | 13 (19) | 16 (73) | | |

Table 3. Participant and Non-participant Characteristics

| <i>Question Description</i> | <i>Non-Participants</i> | <i>Participants</i> | <i>T-statistic or Chi-Square</i> | <i>P value</i> |
|--|-------------------------|---------------------|----------------------------------|----------------|
| I don't like to. | % (n) | % (n) | | |
| No = 0 | 80 (121) | 82 (379) | 0.38 | 0.54 |
| Yes = 1 | 20 (31) | 18 (84) | | |
| It's too late to improve my health. | % (n) | % (n) | | |
| No = 0 | 96 (146) | 97 (452) | 0.09 | 0.76 |
| Yes = 1 | 4 (6) | 3 (16) | | |
| It's not safe. | % (n) | % (n) | | |
| No = 0 | 87 (130) | 85 (393) | 0.29 | 0.59 |
| Yes = 1 | 13 (20) | 15 (70) | | |
| | | | | |
| EPESE Summary Score | | | | |
| n | 439 | 115 | | |
| Mean ± SD | 7.90 ± 2.7 | 7.34 ± 2.9 | -1.96 | 0.0506 |
| | % (n) | % (n) | | |
| Category 1 (low: 0 to 5) | 17 (58) | 25 (26) | 2..93 | 0.23 |
| Category 2 (average: 6 to 9) | 50 (168) | 48 (49) | | |
| Category 3 (high: 10 to 12) | 32 (107) | 27 (28) | | |
| | | | | |
| Fullerton Functional Fitness Test | | | | |
| Chair Stands (number in 30 sec.) | | | | |
| n | 422 | 121 | | |
| Mean ± SD | 10.67 ± 3.2 | 10.46 ± 3.4 | -0.62 | 0.54 |
| Arm Curls (number in 30 sec.) | | | | |
| n | 484 | 147 | -0.96 | 0.34 |
| Mean ± SD | 13.84 ± 4.4 | 13.39 ± 5.1 | | |
| Sit-and -Reach (inches) | | | | |
| n | 483 | 144 | -0.17 | 0.87 |
| Mean ± SD | -1.40 ± 4.0 | -1.46 ± 4.5 | | |
| 8-foot Up-and-Go (seconds) | | | | |
| n | 440 | 129 | 1.27 | 0.21 |
| Mean ± SD | 9.82 ± 4.0 | 10.50 ± 5.7 | | |
| Back Scratch (inches) | | | | |
| n | 387 | 142 | 0.19 | 0.85 |
| Mean ± SD | -4.94 ± 5.0 | -4.84 ± 5.7 | | |

Table 4. Fullerton Functional Fitness Scores by Age

| <i>Description</i> | All | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
|--------------------------------------|-----------|------------|------------|------------|------------|------------|-----------|-----------|-------|
| Chair Stands | | | | | | | | | |
| Women | | | | | | | | | |
| All (n) | 450 | 35 | 74 | 97 | 95 | 80 | 49 | 8 | 1 |
| Means ± SD | 10.6± 3.3 | 12.1 ± 3.9 | 10.8 ± 3.3 | 11.2 ± 3.1 | 10.9 ± 3.0 | 10.0 ± 3.2 | 9.0 ± 3.2 | 7.5 ± 2.1 | 10.0 |
| Caucasian (n) | 285 | 28 | 40 | 62 | 68 | 51 | 27 | 2 | 1 |
| Means ± SD | 10.9± 3.4 | 12.7 ± 3.8 | 10.6 ± 3.5 | 11.7 ± 3.2 | 11.1 ± 3.0 | 10.1 ± 3.3 | 9.1 ± 3.7 | 7.5 ± 3.5 | 10.0 |
| African American (n) | 161 | 7 | 32 | 35 | 26 | 29 | 22 | 6 | 0 |
| Means ± SD | 9.9± 2.8 | 9.4 ± 3.5 | 10.7 ± 2.7 | 10.3 ± 2.6 | 10.3 ± 2.9 | 9.7 ± 3.1 | 8.8 ± 2.4 | 7.5 ± 1.9 | |
| 50th %, reference range ¹ | | 15 | 14 | 13 | 12 | 11 | 10 | 8 | |
| Normal range, 26% - 74% ¹ | | 12-17 | 11-16 | 10-15 | 10-15 | 9-14 | 8-13 | 4-11 | |
| Men | | | | | | | | | |
| All (n) | 86 | 5 | 10 | 16 | 28 | 18 | 5 | 1 | 0 |
| Means ± SD | 10.7± 3.3 | 10.8 ± 2.2 | 12.4 ± 2.9 | 10.2 ± 3.2 | 10.8 ± 3.0 | 10.5 ± 4.3 | 9.8 ± 4.5 | 10.0 | |
| Caucasian (n) | 64 | 5 | 8 | 12 | 18 | 12 | 5 | 1 | |
| Means ± SD | 11.2± 3.2 | 10.8 ± 2.2 | 12.5 ± 2.8 | 11.3 ± 2.7 | 11.8 ± 2.7 | 10.1 ± 4.4 | 9.8 ± 4.5 | 10.0 | |
| African American (n) | 21 | 0 | 2 | 4 | 9 | 6 | 0 | 0 | |
| Means ± SD | 9.2± 3.4 | | 12.0 ± 4.2 | 6.8 ± 1.7 | 8.3 ± 2.3 | 11.3 ± 4.3 | | | |
| 50th %, reference range ¹ | | 16 | 15 | 14 | 14 | 12 | 11 | 10 | |
| Normal range, 26% - 74% ¹ | | 14-19 | 12-18 | 12-17 | 11-17 | 10-15 | 8-14 | 7-12 | |

Table 4. Fullerton Functional Fitness Scores by Age

| <i>Description</i> | All | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
|--------------------------------------|-----------|------------|------------|------------|------------|------------|------------|------------|-------|
| Arm Curls | | | | | | | | | |
| Women | | | | | | | | | |
| All (n) | 518 | 38 | 77 | 106 | 115 | 96 | 59 | 12 | 1 |
| Means ± SD | 13.5± 4.4 | 14.8 ± 4.1 | 13.7 ± 4.2 | 14.5 ± 4.5 | 13.7 ± 4.1 | 13.0 ± 4.8 | 11.5 ± 3.5 | 11.3 ± 3.0 | 13.0 |
| Caucasian (n) | 326 | 30 | 42 | 67 | 76 | 63 | 36 | 4 | 1 |
| Means ± SD | 14.1± 4.3 | 15.3 ± 4.3 | 13.6 ± 4.0 | 15.3 ± 4.6 | 14.4 ± 4.1 | 12.9 ± 4.5 | 12.4 ± 3.5 | 12.5 ± 1.9 | 13.0 |
| African American (n) | 187 | 8 | 33 | 39 | 37 | 33 | 23 | 8 | 0 |
| Means ± SD | 12.6± 4.3 | 12.6 ± 2.4 | 13.6 ± 4.4 | 13.0 ± 4.0 | 12.6 ± 3.8 | 13.1 ± 5.5 | 10.0 ± 3.2 | 10.8 ± 3.4 | |
| 50th %, reference range ¹ | | 16 | 15 | 14 | 14 | 13 | 12 | 11 | |
| Normal range, 26% -74% ¹ | | 13-19 | 12-18 | 12-17 | 11-17 | 10-16 | 10-15 | 8-13 | |
| Men | | | | | | | | | |
| All (n) | 105 | 6 | 12 | 19 | 31 | 25 | 8 | 1 | 0 |
| Means ± SD | 14.8± 5.3 | 17.2 ± 7.2 | 15.9 ± 5.9 | 13.7 ± 5.6 | 14.3 ± 4.3 | 14.7 ± 5.7 | 13.8 ± 4.2 | 17.0 | |
| Caucasian (n) | 75 | 5 | 10 | 13 | 19 | 17 | 7 | 1 | |
| Means ± SD | 15.7± 5.1 | 17.4 ± 8.0 | 14.9 ± 5.0 | 14.6 ± 4.4 | 15.9 ± 4.3 | 15.8 ± 6.0 | 14.3 ± 4.2 | 17.0 | |
| African American (n) | 29 | 1 | 2 | 6 | 11 | 8 | 1 | 0 | |
| Means ± SD | 12.6± 5.4 | 16.0 | 21.0 ± 9.9 | 11.8 ± 7.9 | 11.7 ± 3.1 | 12.3 ± 4.3 | 10.0 | | |
| 50th %, reference range ¹ | | 19 | 18 | 17 | 16 | 16 | 14 | 12 | |
| Normal range, 26% -74% ¹ | | 16-22 | 15-21 | 14-21 | 13-19 | 13-19 | 11-17 | 10-14 | |

Table 4. Fullerton Functional Fitness Scores by Age

| <i>Description</i> | All | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
|--------------------------------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------|
| Sit-and-Reach | | | | | | | | | |
| Women | | | | | | | | | |
| All (n) | 518 | 38 | 73 | 110 | 111 | 99 | 60 | 12 | 1 |
| Means ± SD | -1.3 ± 4.0 | -0.7 ± 4.9 | -1.2 ± 4.1 | -0.7 ± 3.8 | -1.7 ± 3.8 | -1.5 ± 3.8 | -2.3 ± 3.9 | -1.8 ± 3.7 | -1.0 |
| Caucasian (n) | 323 | 30 | 39 | 70 | 72 | 64 | 36 | 4 | 1 |
| Means ± SD | -1.1 ± 4.0 | -0.3 ± 4.5 | -1.2 ± 4.3 | -0.6 ± 3.8 | -1.3 ± 4.1 | -1.4 ± 3.6 | -2.3 ± 4.1 | -3.4 ± 4.8 | -1.0 |
| African American (n) | 190 | 8 | 32 | 40 | 37 | 35 | 24 | 8 | 0 |
| Means ± SD | -1.6 ± 3.9 | -2.4 ± 6.1 | -1.2 ± 4.3 | -1.0 ± 3.9 | -2.6 ± 3.3 | -1.6 ± 4.2 | -2.2 ± 3.7 | -1.1 ± 3.1 | |
| 50th %, reference range ¹ | | 2.1 | 2.0 | 1.4 | 1.2 | 0.5 | -0.1 | -1.7 | |
| Normal range, 26% -74% ¹ | | -0.5 - 5.0 | -0.5 - 4.5 | -1.0 - 4.0 | -1.5 - 0.5 | -5.5 - 0.0 | -7.0 - -1.0 | -8.0 - -1.0 | |
| Men | | | | | | | | | |
| All (n) | 101 | 5 | 12 | 19 | 30 | 24 | 7 | 1 | 0 |
| Means ± SD | -1.4 ± 4.6 | -1.0 ± 4.3 | -0.3 ± 4.5 | -2.8 ± 3.4 | -1.1 ± 3.8 | -0.9 ± 6.0 | -2.6 ± 5.8 | 0.5 | |
| Caucasian | 71 | 4 | 10 | 13 | 18 | 16 | 6 | 1 | |
| Means ± SD | -1.5 ± 4.6 | 0.5 ± 3.2 | -1.4 ± 3.6 | -3.5 ± 3.8 | -0.5 ± 3.8 | -0.9 ± 6.5 | -1.7 ± 5.8 | 0.5 | |
| African American (n) | 29 | 1 | 2 | 6 | 11 | 8 | 1 | 0 | |
| Means ± SD | -1.4 ± 4.5 | -7.0 | 5.2 ± 6.2 | -1.3 ± 1.6 | -2.0 ± 4.0 | -0.8 ± 5.1 | -8.0 | | |
| 50th %, reference range ¹ | | 0.6 | 0.0 | 0.0 | -1.1 | -2.0 | -2.4 | -3.6 | |
| Normal range, 26% -74% ¹ | | -2.5 - 4.0 | -3.0 - 3.0 | -3.0 - 3.0 | -4.0 - 2.0 | -5.5 - 1.5 | -5.5 - 0.5 | -6.5 - -0.5 | |

Table 4. Fullerton Functional Fitness Scores by Age

| <i>Description</i> | All | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
|--------------------------------------|------------|-----------|-----------|------------|------------|-------------|------------|------------|-------|
| 8-foot Up-and-Go | | | | | | | | | |
| Women | | | | | | | | | |
| All (n) | 466 | 35 | 68 | 102 | 94 | 88 | 54 | 11 | 1 |
| Means ± SD | 9.9 ± 4.1 | 8.4 ± 3.2 | 8.8 ± 3.4 | 9.2 ± 3.7 | 9.7 ± 3.5 | 10.8 ± 5.0 | 11.9 ± 4.3 | 13.9 ± 4.7 | 10.4 |
| Caucasian (n) | 299 | 28 | 38 | 66 | 61 | 60 | 34 | 4 | 1 |
| Means ± SD | 9.7 ± 4.2 | 8.4 ± 2.9 | 8.7 ± 3.6 | 9.0 ± 3.8 | 8.8 ± 3.0 | 10.8 ± 5.4 | 12.1 ± 4.5 | 16.8 ± 1.5 | 10.4 |
| African American (n) | 163 | 7 | 29 | 36 | 31 | 28 | 20 | 7 | 0 |
| Means ± SD | 10.3 ± 4.0 | 8.0 ± 4.3 | 8.7 ± 3.2 | 9.6 ± 3.5 | 11.6 ± 3.7 | 10.7 ± 4.1 | 11.4 ± 4.1 | 12.3 ± 5.2 | |
| 50th %, reference range ¹ | | 5.2 | 5.6 | 6.0 | 6.3 | 7.2 | 7.9 | 9.4 | |
| Normal range, 26% -74% ¹ | | 6.0 - 4.4 | 6.4 - 4.8 | 7.1 - 4.9 | 7.4 - 5.2 | 8.7 - 5.7 | 9.6 - 6.2 | 11.5 - 7.3 | |
| Men | | | | | | | | | |
| All (n) | 95 | 4 | 10 | 19 | 28 | 24 | 6 | 1 | 0 |
| Means ± SD | 10.0 ± 5.2 | 6.0 ± 1.8 | 7.7 ± 3.1 | 9.7 ± 3.4 | 10.0 ± 3.5 | 12.0 ± 8.2 | 10.3 ± 3.9 | 13.0 | |
| Caucasian (n) | 70 | 4 | 8 | 13 | 19 | 16 | 6 | 1 | |
| Means ± SD | 9.5 ± 4.5 | 6.0 ± 1.8 | 7.3 ± 2.3 | 8.9 ± 2.9 | 9.5 ± 3.6 | 11.9 ± 6.8 | 10.3 ± 3.9 | 13.0 | |
| African American (n) | 24 | 0 | 2 | 6 | 8 | 8 | 0 | 0 | |
| Means ± SD | 11.4 ± 6.8 | | 9.3 ± 6.6 | 11.4 ± 3.9 | 11.2 ± 3.5 | 12.2 ± 11.0 | | | |
| 50th %, reference range ¹ | | 4.7 | 5.1 | 5.3 | 5.9 | 6.4 | 7.2 | 8.1 | |
| Normal range, 26% -74% ¹ | | 5.6 - 3.8 | 5.9 - 4.3 | 6.2 - 4.4 | 7.2 - 4.6 | 7.6 - 5.2 | 8.9 - 5.5 | 10.0 - 6.2 | |

Table 4. Fullerton Functional Fitness Scores by Age

| <i>Description</i> | All | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
|--------------------------------------|------------|------------|-------------|-------------|-------------|-------------|-------------|--------------|-------|
| Back Scratch | | | | | | | | | |
| Women | | | | | | | | | |
| All (n) | 440 | 36 | 62 | 98 | 92 | 79 | 51 | 8 | 1 |
| Means ± SD | -4.6 ± 4.9 | -3.9 ± 3.6 | -5.1 ± 4.5 | -4.5 ± 4.1 | -4.5 ± 5.8 | -3.8 ± 4.6 | -5.7 ± 6.2 | -7.4 ± 5.7 | -3.0 |
| Caucasian (n) | 270 | 29 | 34 | 61 | 59 | 48 | 28 | 2 | 1 |
| Means ± SD | -3.8 ± 4.2 | -3.8 ± 3.6 | -4.4 ± 4.8 | -3.8 ± 3.7 | -3.1 ± 4.0 | -3.1 ± 4.1 | -5.4 ± 5.5 | -3.5 ± 4.9 | -3.0 |
| African American (n) | 166 | 7 | 26 | 37 | 31 | 31 | 23 | 6 | 0 |
| Means ± SD | -5.8 ± 5.7 | -4.2 ± 4.0 | -6.1 ± 4.0 | -5.6 ± 4.6 | -6.7 ± 7.5 | -4.8 ± 5.3 | -5.9 ± 7.1 | -8.8 ± 5.7 | |
| 50th %, reference range ¹ | | -0.7 | -1.2 | -2.2 | -2.6 | -3.1 | -4.5 | -5.2 | |
| Normal range, 26% -74% ¹ | | -3.0 - 1.5 | -3.5 - 1.5 | -4.0 - 1.0 | -5.0 - 0.5 | -5.5 - 0.5 | -7.0 - -1.0 | -8.0 - -1.0 | |
| | | | | | | | | | |
| Men | | | | | | | | | |
| All (n) | 84 | 5 | 10 | 16 | 25 | 19 | 5 | 1 | 0 |
| Means ± SD | -6.7 ± 6.3 | -8.9 ± 8.2 | -5.3 ± 4.7 | -5.0 ± 8.1 | -7.1 ± 4.6 | -9.0 ± 6.2 | -5.0 ± 9.8 | -3.0 | |
| Caucasian (n) | 57 | 5 | 8 | 11 | 12 | 12 | 5 | 1 | |
| Means ± SD | -5.5 ± 6.3 | -8.9 ± 8.2 | -4.8 ± 4.8 | -2.1 ± 7.1 | -7.5 ± 5.2 | -6.7 ± 5.5 | -5.0 ± 9.8 | -3.0 | |
| African American (n) | 26 | 0 | 2 | 5 | 12 | 7 | 0 | 0 | |
| Means ± SD | -9.3 ± 5.7 | | -7.0 ± 4.9 | -11.3 ± 7.2 | -6.8 ± 4.2 | -13.1 ± 5.6 | | | |
| 50th %, reference range ¹ | | -3.4 | -4.1 | -4.5 | -5.6 | -5.7 | -6.2 | -7.2 | |
| Normal range, 26% -74% ¹ | | -6.5 - 0.0 | -7.5 - -1.0 | -8.0 - -1.0 | -9.0 - -2.0 | -9.5 - -2.0 | -9.5 - -3.0 | -10.5 - -4.0 | |

Additional Information on Statistical Analysis

For Specific Aim #1, all data was analyzed by descriptive techniques, including means, standard deviations, and frequencies. For Specific Aim #2, pre- and post-test analyses was performed using Chi square and paired t-tests. For example, Chi square tests were used to determine if the percentage of participants who knew knowledge questions, such as the correct number of fruits and vegetables that should be eaten daily (five) improved, or if the percentage of subjects who performed the balance exercises increased after implementation of the program. Similarly, paired t-tests were used to determine if the mean intake of fruits and vegetables and the physical performance of participants increased after the program was implemented. Quantitative and qualitative information from open-ended questions was used to assess participant satisfaction with the program. Specific Aim #3 was addressed by evaluating quantitative and qualitative responses by the educators to the Speaker/Leader Questionnaire and by participants in the post-test questionnaire. The results can be seen in the following pages.

The evaluation of the data from the exercise batteries was conducted under the following limitations/parameters. Values greater than six standard deviations were noted as outliers, and then these cases were evaluated on an individual basis (e.g. for use of canes or walkers). Additionally, careful scrutiny of the data revealed that two of the test items, both measuring walking speed, (approximately 8 foot and approximately 16 foot) appeared to have been collected incorrectly in some counties. The data for both of the test items was omitted from the analysis in those counties in which the 16-foot walk was completed in less time than the 8-foot walk or if the 16-foot walk was completed in less than 1.5 times as fast as the 8-foot walk.

Leader Questionnaire Evaluation and Comments after the Nutrition Education and Leg
Exercise Program was Completed

- I work at the senior center as a(n):

| | |
|-----------------------------|-----|
| Cooperative Extension Agent | 18% |
| AAA staff | 46% |
| Other | 36% |

- I was trained to use the Speaker's Kit by:

| | |
|-----------------------------|-----|
| Senior Center Director | 9% |
| Division of Aging Trainer | 86% |
| Cooperative Extension Agent | 5% |

- I have training as a:

| | |
|-----------------------------|-----|
| Dietitian | 9% |
| Cooperative Extension Agent | 23% |
| Other | 64% |
| No training | 4% |

- I personally engage in at least 30 minutes of physical activity most days of the week:

| | |
|--------|-----|
| Always | 50% |
| Often | 50% |

- I personally consume at least 5 servings of fruits and vegetables per day:

| | |
|--------|-----|
| Always | 50% |
| Often | 50% |

- Over 75% of leaders believe that all topics in the Speaker's Kit should be included.

- The introduction page and explanation page are easy to understand:

| | |
|--------------------|-----|
| Very Easy | 69% |
| Easy | 25% |
| Somewhat Difficult | 6% |

- The text in the scripts for each topic in the Speaker's Kit is easy to understand and follow:

| | |
|----------------|-----|
| Strongly Agree | 56% |
| Agree | 44% |

- The text in the scripts for each topic in the Speaker's Kit is easy to teach participants:

| | |
|----------------|-----|
| Strongly Agree | 56% |
| Agree | 44% |

- The characters and pictures used in the Speaker's Kit make learning the lessons easier for the presenter/leader:

| | |
|----------------|-----|
| Strongly Agree | 63% |
| Agree | 37% |

- The characters and pictures used in the Speaker's Kit make learning the lessons easier for the participants:

| | |
|----------------|-----|
| Strongly Agree | 75% |
| Agree | 25% |

- The games and activities provided in the Speaker's Kit are fun and age appropriate for older adults:

| | |
|--------------------|-----|
| Strongly Agree | 75% |
| Agree | 19% |
| Somewhat Difficult | 6% |

- The hand-outs provided with the Speaker's Kit help to reinforce the lessons to participants:

| | |
|----------------|-----|
| Strongly Agree | 88% |
| Agree | 12% |

- How often do you use the Speaker's Kit?

| | |
|----------------------------|-----|
| 1 time per week | 13% |
| 1 to 2 times per month | 81% |
| less than 1 time per month | 6% |

- I would recommend the Speaker's Kit to colleagues working with older adults:

| | |
|----------------|-----|
| Strongly Agree | 75% |
| Agree | 25% |

- The Speaker's Kit has enabled me to provide a better quality of service to the senior center participants:

| | |
|----------------|-----|
| Strongly Agree | 81% |
| Agree | 19% |

- I would like the Division of Aging Services to take the lead in developing nutrition/health promotion resource materials and training for those materials:

| | |
|----------------|-----|
| Strongly Agree | 81% |
| Agree | 19% |

- The placemat will be a valuable tool for use in conjunction with the Speaker's Kit:

| | |
|----------------|-----|
| Strongly Agree | 69% |
| Agree | 31% |

- The directions on both sides of the placemat are clear and easy to understand:

| | |
|----------------|-----|
| Strongly Agree | 81% |
| Agree | 19% |

- It is important to have the days of the week listed on the placemat so the participant can track exercise activity:

| | |
|----------------|-----|
| Strongly Agree | 75% |
| Agree | 25% |

- The photographs of the exercises are clear:

| | |
|----------------|-----|
| Strongly Agree | 81% |
| Agree | 19% |

- It is helpful to be able to track the repetition goals in the boxes provided on the placemat:

| | |
|-------------------|-----|
| Strongly Agree | 56% |
| Agree | 31% |
| Somewhat Disagree | 13% |

- It is easy to understand how the exercises should be performed by looking at the photographs:

| | |
|----------------|-----|
| Strongly Agree | 75% |
| Agree | 25% |

- The Take Down Fat message should be included on the placemat:

| | |
|----------------|-----|
| Strongly Agree | 50% |
| Agree | 50% |

- The Take 5 A Day message should be included on the placemat:

| | |
|----------------|-----|
| Strongly Agree | 63% |
| Agree | 37% |

- It is helpful to have the examples of low-fat choices pictured on the placemat:

| | |
|-------------------|-----|
| Strongly Agree | 75% |
| Agree | 19% |
| Somewhat Disagree | 6% |

- It is helpful to be able to circle the number of servings of fruit and vegetables that have been consumed:

| | |
|-------------------|-----|
| Strongly Agree | 50% |
| Agree | 38% |
| Somewhat Disagree | 12% |

- The explanation of "What is a serving?" is easy to understand and should be included on the placemat:

| | |
|-------------------|-----|
| Strongly Agree | 60% |
| Agree | 33% |
| Somewhat Disagree | 7% |

Educator Comments

What are some other materials that would be useful to your Senior Center?

- Recipes and strategies to help my clients improve their diets and menus.
- Make activities appropriate for low literacy older adults (i.e., delete word games).
- Blank menus to help them practice planning menus they can follow at home.
- Enlarged poster-sized place mat for the exercise program.
- Putting the nutrition education lessons on Power Point.
- Incorporate good exercise music.
- Include hand weights for the exercise program.
- A trained leader for the exercise program.
- Overhead projector and screen to use with nutrition lessons.
- Videos to supplement nutrition lessons and exercise program.

What other topics would you like to see included in the Speaker's Kit?

- Tips on managing your diet while on medications.
- Vitamins and nutritional supplements
- Preventing falls
- Managing medications
- Depression
- Eyes, hearing, and skin

PRE-TEST PARTICIPANT EVALUATION

Take Charge of Your Health – The Active Older Adult Speaker’s Kit & Leg Exercises for Strength and Balance

| | <i>Read each question to the participant and record their answer. Encourage the participant to answer all questions and to give the best answer they can.</i> | | <i>Please do not write in this column.</i> |
|----|---|--|--|
| A1 | Participant ID: | _____ | |
| A2 | County | | |
| A3 | Age | _____ | |
| | | Circle One | |
| A4 | Gender | Male (0) Female (1) | |
| A5 | Ethnicity | White (0) Black (1) Hispanic (2) Asian (3) Other (4) | |
| A6 | Would you say that in general your health is: | Excellent (1) Very Good (2) Good (3) Fair (4) Poor (5) | |
| A7 | How much do your health troubles stand in the way of you doing things? | Not at all (0) A little (1) A great deal (2) | |

| | | Circle One | |
|------------|---|---|--|
| A8 | How important is it to your health to be active on all or most days of the week? | Not at all (0) Somewhat (1) Very (2) Extremely (3) | |
| | For Questions A9-A14: Do not read responses. Probe with categories as needed. Write response in the blanks. <i>Think about your diet during the past month ...</i> | <i>Write servings in blanks.</i> | |
| A9 | How often did you drink fruit juices such as orange, grapefruit, or tomato? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| A10 | Not counting juice, how often did you eat fruit? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| A11 | How often did you eat green salad? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| A12 | How often did you eat potatoes not including french fries, fried potatoes, or potato chips? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| A13 | How often did you eat carrots? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| A14 | Not counting carrots, potatoes, or salad, how many servings of vegetables did you usually eat? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |

| | | Circle one | |
|-----|---|---|--|
| A15 | How are your vegetables usually prepared? | Fried (0) Steamed or boiled (1) Uncooked or raw (2) | |
| A16 | How many servings of fruits and vegetables <u>should</u> people eat each day? | 0 1 2 3 4 5 or more | |
| A17 | On average, how much milk do you usually drink or eat on cereal each day? | Cups: 0 1 2 3 or more | |
| A18 | What type of milk do you usually drink? | (0) Don't drink milk (1) Whole (2) 2% (3) 0.5-1% (4) Skim | |
| A19 | To lower your risk of developing heart disease or stroke, are you? a. Eating fewer high fat or high cholesterol foods? | Yes (1) No (2) Don't know/No response (3) | |
| A20 | b. Exercising more? | Yes (1) No (2) Don't know/No response (3) | |
| A21 | How is your meat, chicken, or fish usually prepared? | Fried (0) Broiled or grilled (1) Baked (2) | |
| A22 | I read the nutrition labels on food packages before I buy. | No (0) Yes (1) | |
| A23 | What kind of fat increases the risk of heart disease? | Saturated fat (0) Unsaturated fat (1) Don't know (2) | |

| | | Circle One | |
|-----|---|--|--|
| A24 | How many blocks can you walk without stopping? | 0 1 2 3 4 or more blocks | |
| A25 | During the past <u>month</u>, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise? | No (0) Yes (1) | |
| A26 | During the past <u>week</u>, did you do leg exercises (as shown in this picture)? | No (0) Yes (1) | |
| A27 | During the past <u>month</u>, did you do leg exercises (as shown in this picture)? | No (0) Yes (1) | |
| A28 | How much physical activity should people do most days of the week? | (0) 0 minutes (1) 1-5 minutes (2) 6-10 minutes (3) 11-15 minutes (4) 16-20 minutes (5) 21-25 minutes (6) 26-29 minutes (7) 30 or more | |
| | Do any of the following keep you from being active on all or most days of the week? | | |
| A29 | I have a health condition that keeps me from being active. | No (0) Yes (1) | |
| A30 | I already am active on all or most days of the week. | No (0) Yes (1) | |
| A31 | It costs too much. | No (0) Yes (1) | |
| A32 | I don't have time. | No (0) Yes (1) | |
| A33 | I don't like to. | No (0) Yes (1) | |
| A34 | It's too late to improve my health. | No (0) Yes (1) | |
| A35 | It's not safe. | No (0) Yes (1) | |

| | EPESE SHORT BATTERY Physical Performance Test - Task Descriptions <i>Equipment:</i> <i>Stop watch, 8 foot tape measure, chair with no arms</i> | RECORD TIME IN SECONDS | |
|------------|--|--|--|
| ASB | <p>STANDING BALANCE:</p> <p>Includes (a) semi-tandem (heel of one foot placed at mid-position of the other) followed by either:</p> <p>(b) tandem (one foot directly in front of the other, heel to toe) if semi-tandem is held for 10 seconds OR</p> <p>(c) side-by-side if semi-tandem is not held for 10 seconds.</p> <p>Each is timed until 10 seconds, participant moves feet, or grasps support, whichever first occurs.</p> | <p>Time in seconds to the nearest 10th second:</p> <p>(a) _____</p> <p>(b) _____</p> <p>(c) _____</p> | |
| AFW | <p>8 FOOT WALK:</p> <p>Participant is timed to walk an 8-foot straight walking course at their normal gait, using any assistive devices they normally use while walking (such as canes or walkers).</p> <p>Participant completes walk 2 times.</p> | <p>Time in seconds to the nearest 10th second (do twice):</p> <p>(a) _____</p> <p>(b) _____</p> <p>(c) Was assistive device used? (0) No (1) Yes</p> | |
| ACS | <p>CHAIR STANDS:</p> <p>Participant is asked to stand one-time from a seated position on a straight-backed chair with their arms folded across their chest.</p> <p>If successful, participant is asked to stand up and sit down 5 more times as quickly as possible.</p> <p>If not initially successful, then it is not performed beyond initial request.</p> | <p>Time in seconds to the nearest 10th second for 5 times quickly:</p> <p>(a) _____</p> | |
| | <p style="text-align: center;">Notes on scoring (seconds):</p> <p>Standing balance: 1= <1.0; 2= ≥1.0 and ≤2; 3= 3-9; 4= 10+</p> <p>Walk 8 feet: 1= ≥5.7; 2= 4.1-5.6; 3= 3.2-4.0; 4= ≤3.1</p> <p>Chair stand 5 times: 1= ≥16.7; 2= 13.7-16.6; 3= 11.2-13.6; 4= ≤11.1</p> | | |

| Functional Fitness Test for Older Adults | | |
|---|--|--|
| AFF1 | 30-Second Chair Stand | # Stands in 30 Sec.: _____ |
| AFF2 | Arm Curl | # Curls in 30 Sec.: _____ |
| AFF3 | Chair Sit-and-Reach (<i>two times</i>) | <p>Time 1 # Inches person is short of reaching the toe: _____ (-) <i>or</i> # Inches person reaches beyond toe _____ (+) <i>Measure to the nearest 1/2 inch</i></p> <p>Time 2 # Inches person is short of reaching the toe _____ (-) <i>or</i> # Inches person reaches beyond toe _____ (+) <i>Measure to the nearest 1/2 inch</i></p> |
| AFF4 | 8-Foot Up-and-Go (<i>two times</i>) | <p>Time 1: Time in Sec.: _____</p> <p>Time 2: Time in Sec.: _____</p> |
| AFF5 | Back Scratch (<i>two times</i>) | <p>Time 1 Distance of overlap to the nearest 1/2 inch _____ (+) <i>or</i> Distance between the finger tips to the nearest 1/2 inch: _____ (-)</p> <p>Time 2 Distance of overlap to the nearest 1/2 inch _____ (+) <i>or</i> Distance between the finger tips to the nearest 1/2 inch: _____ (-)</p> |

POST-TEST PARTICIPANT EVALUATION

Take Charge of Your Health – The Active Older Adult Speaker’s Kit & Leg Exercises for Strength and Balance

| | <i>Read each question to the participant and record their answer. Encourage the participant to answer all questions and to give the best answer they can.</i> | <i>Please do not write in this column.</i> |
|-----------|---|--|
| B1 | Participant ID: | ===== |
| B2 | County | |
| B3 | Age | ----- |
| | | Circle One |
| B4 | Gender | Male (0) Female (1) |
| B5 | Ethnicity | White (0) Black (1) Hispanic (2) Asian (3) Other (4) |
| B6 | Would you say that in general your health is: | Excellent (1) Very Good (2) Good (3) Fair (4) Poor (5) |
| B7 | How much do your health troubles stand in the way of you doing things? | Not at all (0) A little (1) A great deal (2) |

| | | Circle One | |
|------------|---|---|--|
| B8 | How important is it to your health to be active on all or most days of the week? | Not at all (0) Somewhat (1) Very (2) Extremely (3) | |
| | For Questions A9-A14: Do not read responses. Probe with categories as needed. Write response in the blanks. <i>Think about your diet during the past month ...</i> | <i>Write servings in blanks.</i> | |
| B9 | How often did you drink fruit juices such as orange, grapefruit, or tomato? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| B10 | Not counting juice, how often did you eat fruit? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| B11 | How often did you eat green salad? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| B12 | How often did you eat potatoes not including french fries, fried potatoes, or potato chips? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| B13 | How often did you eat carrots? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |
| B14 | Not counting carrots, potatoes, or salad, how many servings of vegetables did you usually eat? | Day 1 ___ Week 2 ___ Month 3 ___ Year 4 ___ Never 555 | |

| | | Circle one | |
|------------|---|---|--|
| B15 | How are your vegetables usually prepared? | Fried (0) Steamed or boiled (1) Uncooked or raw (2) | |
| B16 | How many servings of fruits and vegetables <u>should</u> people eat each day? | 0 1 2 3 4 5 or more | |
| B17 | On average, how much milk do you usually drink or eat on cereal each day? | Cups: 0 1 2 3 or more | |
| B18 | What type of milk do you usually drink? | (0) Don't drink milk (1) Whole (2) 2% (3) 0.5-1% (4) Skim | |
| B19 | To lower your risk of developing heart disease or stroke, are you? b. Eating fewer high fat or high cholesterol foods? | Yes (1) No (2) Don't know/No response (3) | |
| B20 | b. Exercising more? | Yes (1) No (2) Don't know/No response (3) | |
| B21 | How is your meat, chicken, or fish usually prepared? | Fried (0) Broiled or grilled (1) Baked (2) | |
| B22 | I read the nutrition labels on food packages before I buy. | No (0) Yes (1) | |
| B23 | What kind of fat increases the risk of heart disease? | Saturated fat (0) Unsaturated fat (1) Don't know (2) | |

| | | Circle One | |
|------------|---|--|--|
| B24 | How many blocks can you walk without stopping? | 0 1 2 3 4 or more blocks | |
| B25 | During the past <u>month</u>, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise? | No (0) Yes (1) | |
| B26 | During the past <u>week</u>, did you do leg exercises (as shown in this picture)? | No (0) Yes (1) | |
| B27 | During the past <u>month</u>, did you do leg exercises (as shown in this picture)? | No (0) Yes (1) | |
| B28 | How much physical activity should people do most days of the week? | (0) 0 minutes (1) 1-5 minutes (2) 6-10 minutes (3) 11-15 minutes (4) 16-20 minutes (5) 21-25 minutes (6) 26-29 minutes (7) 30 or more | |
| | Do any of the following keep you from being active on all or most days of the week? | | |
| B29 | I have a health condition that keeps me from being active. | No (0) Yes (1) | |
| B30 | I already am active on all or most days of the week. | No (0) Yes (1) | |
| B31 | It costs too much. | No (0) Yes (1) | |
| B32 | I don't have time. | No (0) Yes (1) | |
| B33 | I don't like to. | No (0) Yes (1) | |
| B34 | It's too late to improve my health. | No (0) Yes (1) | |
| B35 | It's not safe. | No (0) Yes (1) | |

| ATTENDANCE AND PARTICIPATION MEASURES: | | |
|--|--|--|
| <i>This information is on attendance logs kept by the instructors.</i> | | |
| B35 | How many times did the participant attend the nutrition education lessons at the senior center? | # of times attended __ # of times offered __ |
| B36 | How many times did the participant attend the leg exercise sessions at the senior center? | # of times attended __ # of times offered __ |
| B37 | On average, how many days each week did the participant do the leg exercises? | Number__ __ |
| <i>Ask the participant these questions . . .</i> | | |
| B38 | Overall, how would you rate the nutrition lessons? | Excellent (1) Very Good (2) Good (3) Fair (4) Poor (5) |
| B39 | Overall, how would you rate the leg exercises? | Excellent (1) Very Good (2) Good (3) Fair (4) Poor (5) |
| B40 | What did you <u>like</u> about the nutrition lessons? | |
| B41 | What did you <u>not like</u> about the nutrition lessons? | |
| B42 | What did you <u>like</u> about the leg exercises? | |
| B43 | What did you <u>not like</u> about the leg exercises? | |

| | EPESE SHORT BATTERY Physical Performance Test - Task Descriptions <i>Equipment:</i> <i>Stop watch, 8 foot tape measure, chair with no arms</i> | RECORD TIME IN SECONDS | |
|------------|--|--|--|
| BSB | <p>STANDING BALANCE:</p> <p>Includes (a) semi-tandem (heel of one foot placed at mid-position of the other) followed by either:</p> <p>(b) tandem (one foot directly in front of the other, heel to toe) if semi-tandem is held for 10 seconds OR</p> <p>(c) side-by-side if semi-tandem is not held for 10 seconds.</p> <p>Each is timed until 10 seconds, participant moves feet, or grasps support, whichever first occurs.</p> | <p>Time in seconds to the nearest 10th second:</p> <p>(a) _____</p> <p>(b) _____</p> <p>(c) _____</p> | |
| BFW | <p>8 FOOT WALK:</p> <p>Participant is timed to walk an 8-foot straight walking course at their normal gait, using any assistive devices they normally use while walking (such as canes or walkers).</p> <p>Participant completes walk 2 times.</p> | <p>Time in seconds to the nearest 10th second (do twice):</p> <p>(a) _____</p> <p>(b) _____</p> <p>(c) Was assistive device used? (0) No (1) Yes</p> | |
| BCS | <p>CHAIR STANDS:</p> <p>Participant is asked to stand one-time from a seated position on a straight-backed chair with their arms folded across their chest.</p> <p>If successful, participant is asked to stand up and sit down 5 more times as quickly as possible.</p> <p>If not initially successful, then it is not performed beyond initial request.</p> | <p>Time in seconds to the nearest 10th second for 5 times quickly:</p> <p>(a) _____</p> | |
| | <p style="text-align: center;">Notes on scoring (seconds):</p> <p>Standing balance: 1= <1.0; 2= ≥1.0 and ≤2; 3= 3-9; 4= 10+</p> <p>Walk 8 feet: 1= ≥5.7; 2= 4.1-5.6; 3= 3.2-4.0; 4= ≤3.1</p> <p>Chair stand 5 times: 1= ≥16.7; 2= 13.7-16.6; 3= 11.2-13.6; 4= ≤11.1</p> | | |

| Functional Fitness Test for Older Adults | | |
|---|--|--|
| BFF1 | 30-Second Chair Stand | # Stands in 30 Sec.: _____ |
| BFF2 | Arm Curl | # Curls in 30 Sec.: _____ |
| BFF3 | Chair Sit-and-Reach (<i>two times</i>) | <p>Time 1 # Inches person is short of reaching the toe: _____ (-) <i>or</i> # Inches person reaches beyond toe _____ (+) <i>Measure to the nearest 1/2 inch</i></p> <p>Time 2 # Inches person is short of reaching the toe _____ (-) <i>or</i> # Inches person reaches beyond toe _____ (+) <i>Measure to the nearest 1/2 inch</i></p> |
| BFF4 | 8-Foot Up-and-Go (<i>two times</i>) | <p>Time 1: Time in Sec.: _____</p> <p>Time 2: Time in Sec.: _____</p> |
| BFF5 | Back Scratch (<i>two times</i>) | <p>Time 1 Distance of overlap to the nearest 1/2 inch _____ (+) <i>or</i> Distance between the finger tips to the nearest 1/2 inch: _____ (-)</p> <p>Time 2 Distance of overlap to the nearest 1/2 inch _____ (+) <i>or</i> Distance between the finger tips to the nearest 1/2 inch: _____ (-)</p> |

**EVALUATION OF NUTRITION AND PHYSICAL ACTIVITY PROGRAMS -
CONSENT FORM**

I, _____ agree to take part in the research titled "NUTRITION AND PHYSICAL FITNESS" conducted by Dr. Mary Ann Johnson, Investigator, from the Department of Foods and Nutrition at the University of Georgia. I understand that I do not have to take part if I do not want to. I can stop taking part without giving any reason, and without penalty. I can ask to have all of the information about me returned to me, removed from the research records, or destroyed.

The reason for this study is to evaluate nutrition education and physical activity programs to determine their suitability for senior citizens.

If I volunteer to take part in this study, I will be asked to answer questions about my training, employment, behaviors, and opinions on health, food, nutrition, and physical activity. I will fill out questionnaires before and/or after I give nutrition education and physical activity programs.

The benefits for me are that I will help to develop better nutrition and physical activity programs for older adults. No risk is expected, but I may experience some discomfort or stress when I answer questions about training, employment, and opinions on health, nutrition and physical activity.

No information about me, or provided by me during the research, will be shared with others without my written permission, unless required by law. I will be assigned an identifying number and this number will be used on all of the questionnaires I fill out.

The investigator will answer any further questions about the research, now or during the course of the project (706-542-4838).

I will allow the staff to take my picture, videotape or record me while participating in the study. I can verbally refuse at anytime and my wishes will be upheld. My pictures will only be used to promote the evaluation of this nutrition and physical activity program.

Circle one: YES / NO. Initial _____.

I understand that I am agreeing by my signature on this form to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

| | | | |
|---------------------------|-------|--------------------------|-------|
| _____ | _____ | _____ | _____ |
| Signature of Investigator | Date | Signature of Participant | Date |
| | | | |
| _____ | | | |
| Address | | | |
| | | | |
| _____ | | | |
| Phone Number | | | |

Questions or problems regarding your rights as a participant should be addressed to Ms. Julia Alexander; Institutional Review Board; Office of V.P. for Research; The University of Georgia; 604A Graduate Studies Research Center; Athens, GA 30602-7411; Telephone 706-542-6514.

07/27/00

The Active Older Adult Speakers Kit

Speaker / Leader Questionnaire #1

Instructions: Please check the one response that most clearly indicates your level of agreement with the following statements:

Section A. The following questions relate to general information about the speaker or leader:

| | Cooperative Ext. Agent | Area Agency Staff Rep. | Volunteer | Local Health Dept. Rep. | Other (e.g., Contractor) |
|---|---------------------------|---------------------------|-----------|----------------------------|-----------------------------|
| 1. I work at the Senior Center as a(n): | | | | | |

| | Me | Cooperative Ext. Agent | Area Agency Staff Rep. | Local Health Dept. Rep. | Other (e.g., Contractor) |
|--|----|---------------------------|---------------------------|----------------------------|-----------------------------|
| 2. The nutrition information in the Speakers Kit will be presented to the senior center participants by: | | | | | |

| | Dietician | Nurse | Cooperative Ext. Agent | Other | No Training |
|--|-----------|-------|---------------------------|-------|----------------|
| 3. I have training as a _____ that will help me present the information in the Speakers Kit: | | | | | |

| | Always | Often | Sometimes/ Rarely | Never |
|---|--------|-------|----------------------|-------|
| 4. I personally consume at least 5 servings of fruits and vegetables per day. | | | | |

Section B. The following questions pertain to the 12 topics addressed in the Older Adult Speakers Kit.

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|--|-------------------|-------|----------------------|----------------------|
| 5. The topic on heart disease and high blood pressure should be included in the Speakers Kit. | | | | |
| 6. The topic on "taking" 5 fruits and vegetables per day should be included in the Speakers Kit. | | | | |
| 7. The topic on staying physically active should be included in the Speakers Kit. | | | | |

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|--|----------------|-------|-------------------|-------------------|
| 8. The topic on budgeting fat and finances should be included in the Speakers Kit. | | | | |
| 9. The topic on including fiber in the diet should be included in the Speakers Kit. | | | | |
| 10. The topic on including water in the diet should be included in the Speakers Kit. | | | | |
| 11. The topic on calcium and osteoporosis should be included in the Speakers Kit. | | | | |
| 12. The topic on nutrition and cancer prevention should be included in the Speakers Kit. | | | | |
| 13. The topic on diabetes should be included in the Speakers Kit. | | | | |
| 14. The topic on managing arthritis should be included in the Speakers Kit. | | | | |
| 15. The topic on food safety should be included in the Speakers Kit. | | | | |
| 16. The topic on dental health should be included in the Speakers Kit. | | | | |
| 17. Other topics that could be included in the speakers kit are: | | | | |

Section C. The following questions pertain specifically to the use of the Older Adult Placemat:

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|--|----------------|-------|-------------------|-------------------|
| 18. The placemat will be a valuable tool for use in conjunction with the Speakers Kit. | | | | |

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|--|----------------|-------|-------------------|-------------------|
|--|----------------|-------|-------------------|-------------------|

19. The directions on both sides of the placemat are clear and easy to understand.

20. It is important to have the days of the week listed on the placemat so the participant can track exercise activity.

21. The photographs of the exercises are clear.

22. It is easy to understand how the exercises should be performed by looking at the photographs.

23. The Take Down Fat message should be included on the placemat.

24. The Take 5 A Day message should be included on the placemat.

25. It is helpful to have the examples of low-fat choices pictured on the placemat.

26. It is helpful to be able to circle the number of servings of fruits and vegetables that have been consumed.

27. The explanation of "What is a serving?" is easy to understand and should be included on the placemat.

The Active Older Adult Speakers Kit

Speaker / Leader Questionnaire #2

Instructions: Please check the one response that most clearly indicates your level of agreement with the following statements:

Section A. The following questions relate to general information about the speaker or leader:

| | <6 mos | 6mos-1 yr | 1-3 yrs | 3-5 yrs | >5 yrs |
|---|---------------------------|---------------------------|----------------------------|----------------------------|-----------------------------|
| 1. I have been involved with the Nutrition Program for the Elderly (NPE) for: | | | | | |
| | Cooperative Ext. Agent | Area Agency Staff Rep. | Local Health Dept. Rep. | Volunteer | Other (e.g., Contractor) |
| 2. I work at the Senior Center as a(n): | | | | | |
| | Senior Ctr Director | Div. Of Aging Trainer | Cooperative Ext. Agent | Other Facilitator | I Was Not Trained |
| 3. I was trained to use the Speakers Kit by: | | | | | |
| | Me | Area Agency Staff Rep. | Cooperative Ext. Agent | Local Health Dept. Rep. | Other (e.g., Contractor) |
| 4. The nutrition information in the Speakers Kit was provided to senior center participants by: | | | | | |
| | Dietician | Nurse | Cooperative Ext. Agent | Other | No Training |
| 5. I have training as a _____ that will help me present the information in the Speakers Kit: | | | | | |
| | | Always | Often | Sometimes/ Rarely | Never |
| 6. I personally engage in at least 30 minutes of moderate to vigorous physical activity all or most days of the week. | | | | | |
| | | Always | Often | Sometimes/ Rarely | Never |
| 7. I personally consume at least 5 servings of fruits and vegetables per day. | | | | | |
| 8. Other materials that would be useful to my senior center include: | | | | | |

Section B. The following questions pertain to the 12 topics addressed in the Older Adult Speakers Kit.

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|---|----------------|-------|-------------------|-------------------|
| 9. The topic on heart disease and high blood pressure should be included in the Speakers Kit. | | | | |
| 10. The topic on "taking" 5 fruits and vegetables per day should be included in the Speakers Kit. | | | | |
| 11. The topic on staying physically active should be included in the Speakers Kit. | | | | |

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|--|----------------|-------|-------------------|-------------------|
| 12. The topic on budgeting fat and finances should be included in the Speakers Kit. | | | | |
| 13. The topic on including fiber in the diet should be included in the Speakers Kit. | | | | |
| 14. The topic on including water in the diet should be included in the Speakers Kit. | | | | |
| 15. The topic on calcium and osteoporosis should be included in the Speakers Kit. | | | | |
| 16. The topic on nutrition and cancer prevention should be included in the Speakers Kit. | | | | |
| 17. The topic on diabetes should be included in the Speakers Kit. | | | | |
| 18. The topic on managing arthritis should be included in the Speakers Kit. | | | | |
| 19. The topic on food safety should be included in the Speakers Kit. | | | | |
| 20. The topic on dental health should be included in the Speakers Kit. | | | | |
| 21. Other topics to be included in the Speakers Kit are: | | | | |

Section C. The following questions pertain specifically to the use of the Older Adult Placemats:

| | Very Easy | Easy | Somewhat Difficult | Very Difficult |
|--|----------------|-----------------|------------------------|-------------------|
| 22. The Introduction page and Topic Kits explanation page in the Speakers Kit are easy to understand: | | | | |
| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
| 23. The text in the scripts for each topic in the Speakers Kit is easy to understand and follow. | | | | |
| 24. The text in the script for each topic in the Speakers Kit is easy to teach to participants. | | | | |
| 25. The characters and pictures used in the Speaker Kit make teaching the lessons easier for the presenter/leader. | | | | |
| 26. The characters and pictures used in the Speakers Kit make learning the lessons easier for the participants. | | | | |
| 27. The games and activities provided in the Speakers Kit are fun and age appropriate for older adults. | | | | |
| 28. The hand-outs provided with the Speakers Kit helps to reinforce the lessons to participants. | | | | |
| | Every Day | 1 time per week | 1 to 2 times per month | <1 time per month |
| 29. How often did you use the Speakers Kit?: | | | | |
| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
| 30. I would recommend the Speakers Kit to colleagues working with older adults. | | | | |
| 31. This Speakers Kit has enabled me to provide a better quality of service to the senior center participants | | | | |

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|--|----------------|-------|-------------------|-------------------|
| 32. I would like the Division of Aging Services to take the lead in developing nutrition & health promotion resource materials and training for using those materials. | | | | |

Section D. The following questions pertain specifically to the use of the Older Adult Placemats:

| | Strongly Agree | Agree | Somewhat Disagree | Strongly Disagree |
|---|----------------|-------|-------------------|-------------------|
| 33. The placemat will be a valuable tool for use in conjunction with the Speakers Kit. | | | | |
| 34. The directions on both sides of the placemat are clear and easy to understand. | | | | |
| 35. It is important to have the days of the week listed on the placemat so the participant can track exercise activity. | | | | |
| 36. The photographs of the exercises are clear. | | | | |
| 37. It is easy to understand how the exercises should be performed by looking at the photographs. | | | | |
| 38. It is helpful to be able to track the repetition goals in the boxes provided on the placemat. | | | | |
| 39. The Take Down Fat message should be included on the placemat. | | | | |
| 40. The Take 5 A Day message should be included on the placemat. | | | | |
| 41. It is helpful to have the examples of low-fat choices pictured on the placemat. | | | | |
| 42. It is helpful to be able to circle the number of servings of fruits and vegetables that have been consumed. | | | | |
| 43. The explanation of "What is a serving?" is easy to understand and should be included on the placemat. | | | | |