

IDENTIFICATION OF NUTRITIONAL RISK FACTORS  
AMONG THE MEMBERS OF THE TULSA SENIOR  
NUTRITION PROGRAM USING THE  
NUTRITION SCREENING  
INITIATIVE

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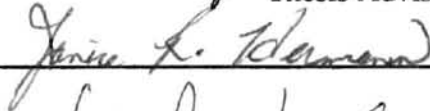
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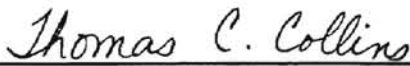
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## CHAPTER I

### INTRODUCTION

With this country's growing elderly population and skyrocketing cost of health care, much emphasis is being placed on wellness and disease prevention. Elderly persons are more often afflicted with diseases that may require intense medical care and incur extensive medical costs. Pinchosfky-Devin and Kaminski (1987) state the high incidence of malnutrition and deficiencies among the elderly point to the need for more aggressive nutrition support among this group. Poor nutritional status and other dietary deficiencies often lead to time spent in the hospital. The DHHS (1991) has found that the elderly (65+) represent 12 percent of the total population and 31 percent of all hospital discharges. The elderly also represent 42 percent of all hospital short stays (Aging America: Trends and projections, 1991). Those 75 and over represent five percent of the total population and 16 percent of all hospital discharges. This group represents 23 percent of all hospital short stays.

Roe (1990) found that minority status, low income, living alone, loss of mobility, low frequency of going outdoors, frequent falls, dental problem and cancer were all related to inadequate nutrient intake among the elderly they studied. The majority of these causes can be reversed, if identified, before malnutrition occurs. This is vital since the consequences of malnutrition are always severe and sometimes deadly. Roubenoff et al. (1987) found that malnourished patients seem to have a prolonged hospital stay, a higher incidence of complications and a higher mortality rate. For this reason, malnutrition in the elderly must be addressed and combated aggressively.



To help identify the risks of malnutrition from occurring, the National Nutrition Screening Initiative (NSI) was formed in early 1990. It is a project of the American Academy of Family Physicians, the American Dietetic Association and the National Council on Aging. The NSI is a five-year multifaceted effort to promote nutrition screening and result in better nutritional care of the elderly in the U.S. It is a direct response to the 1988 Surgeon General's Workshop of Health Promotion and the Human Services Report "Healthy People 2000" for increased nutrition screening of the elderly (Nutrition Screening I: Toward a common view, 1991).

The purpose of this study was to examine the most prevalent risk factors associated with malnutrition that exist among the members of the Tulsa Senior Nutrition Program (Tulsa, Oklahoma). The study was conducted at each of the 23 meal sites in Tulsa county. Each participant was asked to fill out the "DETERMINE Your Nutritional Health" checklist. Scores from this checklist placed participants in one of three categories of nutritional risk. These categories were no risk, moderate risk or high risk. Scores on the DETERMINE checklist were analyzed according to selected variables.

### Objectives

1. To identify the total nutritional risk scores of elderly by using the "DETERMINE Your Nutritional Health" checklist.
2. To identify the relationship between nutritional risk and age, gender, race, living arrangements, receipt of financial assistance and length of participation in the Tulsa Senior Nutrition Program.
3. To identify the prevalence of each nutritional risk included on the "DETERMINE Your Nutritional Health" checklist.
4. To identify associations for each nutritional risk and total nutritional risk mean scores.
5. To identify suggestions and recommendations for nutrition education and policy.

## Hypotheses

- HO 1: There will be no significant relationship between age and nutritional risk of participants.
- HO 2: There will be no significant relationship between gender and nutrition risk of participants.
- HO 3: There will be no significant relationship between race and nutritional risk of participants.
- HO 4: There will be no significant relationship between living arrangement and nutritional risk of participants
- HO 5: There will be no significant relationship between receipt of financial assistance and nutritional risk of participants.
- HO 6: There will be no significant relationship between length of participation in the Tulsa Senior Nutrition Program and nutritional risk of participants

## Assumptions

1. It was assumed that participants answered questions correctly on the "DETERMINE Your Nutritional Health" checklist.
2. It was assumed that there were nutritional risks present among the members of the Tulsa Senior Nutrition Program.

## Limitations

1. Data apply specifically to Tulsa Senior Nutrition Program participants and cannot be generalized to the entire population of elderly persons in the U.S.
2. Data was collected in a group setting, hence, no opportunity will exist to probe for more in-depth information.
3. Data was only be collected for participants who attend the site on the day the survey is completed.

4. Numerical values are located in the "yes" answer box on the "DETERMINE Your Nutritional Health" checklist. There are no numerical values in the "no" answer box. This may give the impression that one type of answer is desired over the other.
5. The "DETERMINE Your Nutritional Health" checklist contained a question regarding alcohol use and a question regarding income level. These questions may be perceived as very personal by the subjects and; therefore, not answered accurately.
6. Nutritional risk score categories are included at the bottom of the "DETERMINE Your Nutritional Health" checklist. Participants could possibly answer questions inaccurately so that they will fall into a certain category of nutritional risk.

#### Definition of Terms

Nutrition Screening Initiative - A five year multifaceted study formed in early 1990 to promote nutrition screening and better nutritional care in the U.S. It is a cooperative effort of the American Academy of Family Physicians, the American Dietetic Association and the National Council on Aging.

"DETERMINE Your Nutritional Health" checklist - A screening tool used in the Nutrition Screening Initiative that relates numerical values to characteristics known to be associated with dietary or nutritional risk factors. DETERMINE is an mnemonic for:

D - Disease  
E - Eating Poorly  
T - Tooth loss/Mouth pain  
E - Economic Hardship  
R - Reduced Social Contact  
M - Multiple Medicines  
I - Involuntary weight loss or gain  
N - Needs assistance in self care  
E - Elder years above age 80

Nutritional Risk Scores - Total scores obtained from the "DETERMINE Your Nutritional Health" checklist. A score from 0-2 indicates no nutritional risk. A score of 3-5 indicates moderate nutritional risk. A score of 6 or more indicates high nutritional risk.

Senior Nutrition Program - Congregate meal sites located in Tulsa county that provide one hot meal 5 days per week (Monday - Friday). Participants or their spouses must be at least 60 years of age. Each meal provides 1/3 of the RDA for this age group. A 75 cent donation is suggested for the meal.

Social activities are also provided at the centers. These activities include: singing, quilting, BINGO, card games, dominoes, support groups and aerobics.

## CHAPTER II

### REVIEW OF LITERATURE

#### Introduction

The proportion of elderly persons in the U.S. population is growing rapidly. In fact, it is estimated that each day 5000 people turn 65, and by the year 2030, 21 percent of the population, or approximately one in five will be at least 65 or over. (Statistical Abstract of the U.S. 1991, 111<sup>th</sup> edition, U.S. Bureau of Census)

With this increase in the elderly population, healthcare costs for this group will likely skyrocket. Currently, older Americans make up almost 12 percent of the population but account for 36 percent of healthcare costs and 30 percent of all hospital stays and drug prescriptions. (Statistical Abstract of the U.S. 1992, 111<sup>th</sup> edition, U.S. Bureau of Census) Due to this fact, health maintenance and disease prevention should be a primary focus among the elderly. Dietary choices made throughout a persons life have been linked to numerous diseases. Eight out of 10 leading causes of death, including heart disease, stroke, some types of cancer and diabetes are related to diet. (Harris, 1991)

Since the older population is increasing and diet choices are linked to many leading causes of death it is now more important than ever to take a close look at the nutritional health of the elderly population. To help these individuals remain healthy longer should be a primary objective for this country. Identifying these risk factors will allow corrective action to be taken so that malnutrition is less likely to occur. Identifying risk factors of malnutrition can be accomplish by nutrition screening. Preventing malnutrition among this age group will lessen the negative financial impact the elderly currently have on this nations healthcare costs.

## Nutritional Status of the Elderly

Malnutrition among elderly persons, dependent and independent, has been researched and found to be present in a large number of elderly persons. Malnutrition can be prevented in many cases if risk-factors associated with the disease are identified.

Probably the most obvious cause of malnutrition is inadequate nutrient intake. To treat inadequate nutrient intake the root of the problem must first be identified. Exton-Smith (1972) indicated that older people who live alone do not consume adequate diets. Bianchetti et al. (1990) found that in a study of 1303 elderly people, 90 percent showed inadequate intake of thiamin and B<sub>6</sub> while 30-40 percent demonstrated deficiencies of vitamins A and C, niacin, B<sub>12</sub>, calcium and iron. Only 10 percent of subjects had inadequate intake of protein. Poor nutritional intake was correlated more strongly with socioeconomic conditions, functional level and affective status than with physical health status.

Elderly men and women are both at risk of malnutrition and may be affected by the same risk factors. However, the presence of one risk factor does not necessarily equate to a specific dietary deficiency. Fischer and Johnson (1990) found that in both men and women, having dentures correlated negatively with protein intake. Lower intakes of vitamins A, B<sub>6</sub>, B<sub>12</sub>, folate, magnesium, zinc and phosphorous were significantly correlated with dental problems in elderly women. In men, dental problems were significantly correlated with low levels of intakes of energy and calcium.

Changes in perception of taste and smell can also decrease the enjoyment of eating and possibly lead to inadequate nutritional intake. Schiffman (1993) states that chemosensory losses, specifically decrements in the senses of taste and smell, can lead to inadequate intake, especially in the elderly sick.

Inadequate nutritional intake is often manifested by significant weight loss. Significant weight loss can be a direct result of malnutrition. Morley (1990) found that in the elderly, clinically significant weight loss is closely related to malnutrition.

Weight loss may not only be related to malnutrition but may also increase the incidence of mortality. Tayback et al. (1990) used data from 4710 white, NHANES respondents 55-74 years of age during 1971-1975 to determine if low weight increased risk for mortality. In men 65-74 years of age a decrease in death rate was seen as BMI increased. This was seen in 9 of the 10 groups studied. A decrease in death rate was not seen for the 10<sup>th</sup> group who had the highest BMI. For women 65-74 years of age there was little variation in mortality within the BMI range of 22-30, distinct evidence of mortality with a BMI less than 22 and suggestive evidence of an increased risk above a BMI of 32. Results of this study affirm observations that low weight may be a significant risk factor in respect to excess mortality.

The recent national effort to reduce the cost of healthcare may be contributing to the incidence of malnutrition. Stephens et al. (1988) states that today, hospital prospective reimbursement procedures are resulting in patients being discharged 'quicker and sicker'. Consequently, patients entering nursing homes may be more significantly malnourished than previously suspected and this trend is likely to continue. With this perspective it is feasible to assume that some elderly patients discharged to their homes to be cared for by family and, or home health agencies may already suffer from some degree of malnutrition.

#### National Health and Nutrition Examination Survey

The first NHANES study was conducted by the National Center for Health Statistics. It studied persons age 1-74 from 1971-1974. More than 1500 people in the study were 60 years of age or older. Dietary intake, blood analysis, urine analysis, clinical findings and anthropometric measures were obtained to determine each subjects health and nutrition status. (National Center for Health Statistics, 1982)

In examining the data from NHANES I, Lowenstein (1976) found that the prevalence of clinical signs suggesting possible nutrient deficiencies was generally low among the elderly. And, even though dietary inadequacies may be widespread these are

usually not severe enough to lead to clinical deficiencies with anatomical lesions in a large number of people. Lowenstein (1982) also found that the elderly had low calorie intake which was seen in all eight of the subgroups studied. Lowenstein (1982) found overall mean intake of eight nutrients, protein, calcium, iron, vitamins A and C and the B vitamins, were adequate in most subgroups except for calcium and iron in women.

In examining NHANES I data, Norton and Wozny (1984) found that the caloric and nutrient intakes of those elderly persons living in urban and rural areas were very similar, whereas the intake levels of suburban elderly adults were significantly higher than both urban and rural elderly adults.

Elderly persons living by themselves are often considered to be at higher nutritional risk than those living with someone else. In examining NHANES I data, Davis et al. (1985) found that proportionately more persons who live alone, and more of those who live with someone other than a spouse, have less favorable dietary status in terms of variety and nutrient intake than do those living with a spouse. Davis et al. (1985) also reports; however, that income was more consistently associated with all of the dietary indicators than was type of living arrangement, which suggests that income is consistently a more important factor in the quality of food consumption of elderly persons.

The second NHANES study was conducted from 1976-1980, 2615 subjects studied were 65-74 years of age. (National Center for Health Statistics, 1982). Results of this study seem to confirm findings from previous studies. In examining NHANES II data, Yetley and Johnson (1987) found low serum zinc values, low folate values in women 45-75, low serum vitamin A levels among blacks and the poor and, low serum vitamin C levels in black males age 55-74. Low vitamin C values were also more prevalent among the poor.

Data from the third NHANES study is not available at this time. NHANES III is a longitudinal study conducted from 1988 - 1994. The study involves two national probability samples, each studied over a 3 year period. NHANES III is unique in that it



has no upper age limit. NHANES I and II only studied persons up to age 74. NHANES III will offer the opportunity to complete nutritional assessments on persons greater than 74 years of age to see how nutritional status affects the outcome of common diseases prevalent in this age group (Harris et al., 1989).

### History and Benefits of the Elderly Nutrition Program

Title VII of the Older Americans Act was created in 1972. The program was designed to meet the nutritional and social needs of persons 60 years of age or older who could not afford an adequate diet, were not able to prepare adequate meals, had limited mobility or were isolated and thus lacked incentive to prepare and eat a meal alone (Greene, 1981).

The program provides older Americans, particularly those with low income, with low cost, nutritionally sound meals in strategically located senior centers and other public or private facilities which can provide social supportive services.

In 1978 significant changes were made to the Older Americans Act. Title III, social services; and Title VII, Nutrition Programs, were consolidated under one Title, III-C. This consolidation incorporated the nutrition services and makes them a component of the Comprehensive and Coordinated Services Deliver System. This is a system for providing all necessary social services, including nutrition services, and, where appropriate, for establishing, maintaining, or constructing multipurpose senior centers within the planning and services area.

The 1978 amendments removed the requirement that the nutrition program services be limited to the older persons identified as eligible in the original legislation. A person 60 years old or older and his or her spouse is now eligible to participate.

The nutrition program is designed to provide a nutritionally sound meal to its participants 5 days per week. Kohrs et al. (1978) stated that Nutrition programs provide at

least one hot meal a day for elderly persons, plus supportive services, in a congregate setting in community locations.

The nutrition program is designed to provide 1/3 of the RDA for persons 60 years of age or older. In a study of the Elderly Nutrition Program in Mississippi, McNaughton and Kilgore (1986) found that the percentage RDA for kilocalories and nutrients from the noon meal compared favorably with those from the Missouri and Indiana centers and met at least 1/3 RDA for nutrients analyzed. Calcium intake was significantly larger for participants than non-participants. Kohrs et al. (1978) found that individuals who ate the program meal on the day of the food record consumed a significantly higher percentage of the allowances for energy, protein and calcium than the other two groups. They also consumed a significantly greater percentage of the allowances for riboflavin and niacin than did the non-participants.

In analyzing the total nutrient content of the noon meal, Kohrs et al. (1978) found that although the guidelines require that only 1/3 of the allowances for each nutrient be included in each meal, the nutrient content of the menus exceeded this amount.

In summary, prevention of malnutrition in the elderly is a main goal of the Nutrition Program for the Elderly. Studies to date have shown that participants in the program have superior nutritional intakes to those who do not participate. Studies also show that meals served are nutritionally sound. The Nutrition Program for the Elderly currently meets its established goals and is socially and nutritionally beneficial to its participants.

**Background and Goals of the Nutrition Screening Initiative (obtained from NSI's publication 'Report of Nutrition Screening I - Toward a Common View')**

Malnutrition is a costly medical condition to treat. It is much more feasible to prevent malnutrition than to treat it. Attempting to prevent malnutrition among this nation's elderly is the primary goal of the Nutrition Screening Initiative. Strong leadership is the basis of this campaign. The initiative is conducted under the leadership of the American Academy of Family Physicians, the American Dietetic Association and the National Council

on the Aging, Inc. It will take many concerned professionals throughout the nation to accomplish these goals.

The NSI was formed in early 1990 as a five year multifaceted effort to promote nutrition screening and better nutritional care in America's health care system. It is a direct response to the call of the 1988 Surgeon Generals Workshop on Health Promotion and Aging and 'Healthy People 2000' for increased nutrition screening. Its initial focus is on the elderly.

Reference materials including different types and levels of screening forms are available to help with the screening process. The assessments have been developed based on research pertaining to the prevalence of nutrition-related problems among older Americans and approaches to nutrition screening and assessment.

The screening instrument used in this study was the "DETERMINE Your Nutritional Health" checklist. It is a public awareness tool designed to identify persons who may be at increased risk of malnutrition. DETERMINE is a mnemonic word. Each letter represents a different nutritional risk factor. The "DETERMINE Your Nutritional Health" checklist consists of 10 nutritional risk statements. Each statement represents a nutritional risk factor which may apply to persons completing the checklist. Once a person is identified by a health professional to be at increased nutritional risk, referrals can be made to provide the individual with needed services which will help decrease his or her nutritional risk (White et al., 1992).

#### Selected Studies using the Nutrition Screening Initiative

Kennedy (1992) utilized the "DETERMINE Your Nutritional Health" checklist to identify nutritional risk factors among the participants of the Elderly Nutrition Program in Oklahoma County. Significant associations were found between total nutritional risk mean scores and Age, Gender, Race, Living Situation, Income and Length of Participation in the

Elderly Nutrition Program. Females, Blacks, and subjects with low income had significantly higher nutritional risk mean scores.

Kennedy (1992) found that subjects less than 60 years of age, Female, Black, living alone, receiving financial assistance and participating in the Elderly Nutrition Program 0 - 6 months had the highest total nutritional risk mean scores.

Zylstra (1992) also utilized the "DETERMINE Your Nutritional Health" checklist to identify total nutritional risk mean scores for persons participating in the Washington State Senior Nutrition Program. This state-wide study found that subjects less than 60 years of age, Female, Native American, living alone, receiving financial assistance and participating in the Senior Nutrition Program from 7 months - 3 years had the highest nutritional risk mean scores.

The rapidly increasing number of elderly persons in the population presents an enormous challenge to the healthcare worker of today. Numerous studies have shown that elderly persons may suffer from a variety of disease, including malnutrition.

The key to preventing malnutrition is to identify risk factors associated with the disease and correct them before malnutrition occurs. This will allow these older Americans the chance to lead more enjoyable, independent, healthy lives. The first step in this process is routine nutrition screening for the elderly.

## CHAPTER III

### METHODS AND PROCEDURES

Early identification of risk factors associated with malnutrition among the elderly can be of great benefit. Early detection may help prevent some of the malnutrition that occurs in this age group.

The purpose of this study was to examine the most prevalent nutritional risk factors among the members of the Tulsa Senior Nutrition Program (Tulsa, Oklahoma). This was accomplished by administering the "DETERMINE Your Nutritional Health" checklist and analyzing relationships between the nutritional risk scores and age, gender, race, living situation, receipt of economic assistance, and length of participation in the Tulsa Senior Nutrition Program (Nutrition Interventions Screening Manual for Professionals caring for Older Americans - Nutrition Screening Initiative, 1991).

#### Research Design

A cross-sectional research design was chosen to identify the most prevalent nutritional risk factors among the elderly enrolled in the Tulsa Senior Nutrition Program at the time the study was conducted. The purpose of a survey is to obtain a statistical profile of the population being studied. A survey can also provide baseline data about the prevalence of conditions or factors in the population; in this case, nutritional risks (Ferber et al., 1980).

### Population and Sample

The population in this study consisted of the 4509 participants enrolled in the Tulsa Senior Nutrition Program in Tulsa county of the state of Oklahoma.

The sample included 596 participants willing to take part in the study who were present at the nutrition site the day the questionnaire was administered.

### Instrumentation

The questionnaire used in this study was an adapted version of the Nutrition Screening Initiatives "DETERMINE Your Nutritional Health" checklist. The original checklist along with more in-depth screening tools have been part of a survey conducted by the Boston University School of Public Health and the New England Research Institute to validate them as consumer awareness tools. The questionnaire was divided into two parts. Part one pertained to demographic and socioeconomic data. Part two pertained to current food intake practices and other factors that may affect food intake.

Adaptations to the checklist included adding a "NO" column to the questionnaire so participants could always provide an answer to each question, re-wording questions for clarity, and obtaining information regarding age, gender, number of persons living in the household, receipt of economic assistance, and length of participation in the Tulsa Senior Nutrition Program. (See Appendix A)

Approval for conducting the study was obtained from the Oklahoma State University Institutional Review Board.

### Collection of the Data

The data was collected at each of the 23 meal sites of the Tulsa Senior Nutrition Program during the summer of 1993.

Participants enrolled in the Tulsa Senior Nutrition Program were asked to participate in this survey. They were informed that this study was designed to identify

those persons at-risk of malnutrition. Participants were informed that completion of the questionnaire was voluntary and would in no way affect their status in the Tulsa Senior Nutrition Program. They were also informed that this study is part of a national effort of the American Dietetic Association, the American Academy of Family Physicians and the National Council on Aging to decrease the risk of malnutrition among the elderly. Participants were informed that all data collected would be confidential and only seen by the researcher and the dietitian for the Tulsa Senior Nutrition Program for follow-up purposes.

The data was collected in a group setting. The researcher distributed questionnaires before lunch and asked the participants to begin by filling out the general information section. Participants were instructed to wait to answer the nutrition questions with the researchers assistance. The researcher then read each question on the questionnaire and explained to the participants what was being asked. This was done to enable the questions to be answered appropriately by the participants in the study.

After the questionnaire was completed risk scores were calculated. The researcher collected the questionnaires and informed the participants that those persons identified to be at risk of malnutrition would have one-on-one counseling by the researcher to further assist them in reducing their risk of malnutrition.

Questionnaires were completed by 596 participants. Completion on the questionnaire took approximately 10 minutes.

### Analyses of the Data

Data from the 596 questionnaires was entered into the computer using the Microsoft Works for Windows program under the spreadsheet option. The data was then analyzed using the Statistical Analysis System (S.A.S., 1985). Frequencies and percentages were used to describe personal characteristics of the subjects and responses to nutritional risk statements. Analysis of variance, student's t-tests, Duncan's multiple range tests and chi-square were used to test the hypotheses in the study.

## CHAPTER IV

### RESULTS AND DISCUSSION

The purpose of this study was to examine the nutritional risk factors among the members of the Tulsa Senior Nutrition Program (Tulsa, Oklahoma). Frequencies and percentages were obtained for the participants' age, gender, race, living situation, income, and length of participation in the Tulsa Senior Nutrition Program. This chapter includes a discussion of the results of data (See questionnaire in Appendix A).

#### Description of Subjects

##### Age, gender and race

The majority of subjects in this study, 356 (78%), were from 65 - 84 years of age. Of these subjects, 211 (36.1%) were 65 - 74 years of age and 245 (41.9%) were 75-84 years of age. Seventy of the subjects (12%), were 85 years or older. The majority of subjects were female, 407 (68.4%) with 188 male subjects, (31.6%). Over three-quarters of the subjects were white, 444 (75.3%). Interestingly, Native Americans were the second largest group with 76 subjects (12.8%), followed by Black participants with 66 subjects, (11.1%). (See Table I).

##### Living Situation, receipt of financial assistance and length of participation

Over one-half of the subjects, 305 (54.7%), reported living alone. Less than 30 percent, 161 (29.4%), reported receipt of financial assistance in the form of SSI, Medicaid or Foodstamps. Over one-half of the subjects, 300 (53.4%), reported length of participation time in the Tulsa Senior Nutrition Program as greater than 3 years. Only 92



TABLE I  
 NUMBER AND PERCENTAGE OF SUBJECTS ACCORDING  
 TO DEMOGRAPHIC VARIABLES  
 N=596\*

Personal Variables	N***	Percentage**
<u>Age (Years)</u>		
Below 60	13	2.2
60-64	46	7.9
65-74	211	36.1
75-84	245	41.9
85 +	70	12.0
Total	585	100.1
<u>Gender</u>		
Male	88	31.6
Female	407	68.4
Total	595	100.0
<u>Race</u>		
White	444	75.3
Black	66	11.1
Native American	76	12.8
Total	586	99.2
<u>Living Situation</u>		
One Person	305	54.7
More than one person	253	45.3
Total	558	100.0
<u>Financial Assistance</u>		
Persons Receiving	161	29.4
Persons Not Receiving	386	70.6
Total	547	100.0
<u>Length of Participation</u>		
0-6 Months	92	16.4
7 Months-3 Years	169	30.1
3+ Years	300	53.4
Total	561	99.9

\*N = 596 based on number of useable responses

\*\*May not equal 100 % due to rounding

\*\*\*N for each question varies due to item non-response

subjects (16.4%), reported participation time in the program as less than 6 months. (See Table I).

### Mean Scores by Personal Variables

Mean scores were calculated for each of the personal variables studied: age, gender, race, living situation, receipt of financial assistance and length of participation time in the Tulsa Senior Nutrition Program. A mean score of 0 - 2 indicated a "good nutritional score" with little risk of malnutrition. A mean score of 3 - 5 indicated "moderate nutritional risk" while a score of 6 or more indicated "high nutritional risk". (See questionnaire in Appendix A).

#### Age, gender and race

Persons less than 60 years of age had the highest mean score, 4.5. This finding is consistent with unpublished data by Zylstra (1992) in the Washington State-wide Congregate Mealsite Survey and Kennedy's (1992) unpublished data pertaining to nutritional risks of elderly utilizing the Nutrition Screening Initiative. Both studies showed that persons less than 60 years of age had the highest mean nutritional scores. A possible reason for this finding could have been that many persons under 60 years of age who attend nutrition programs suffer from some type of disability. The age group with the lowest mean score, 2.8, was 75 - 84 years of age. This finding was also consistent with the Zylstra (1992) and Kennedy (1992) studies. (See Table II).

Females had a mean score of 3.2, higher than the males mean score of 2.6. This was consistent also with the Zylstra (1992) and Kennedy (1992) studies. It is possible that the female participants more conscientiously completed the nutritional risk questionnaires causing a higher reported incidence of nutritional risks. It is interesting to note that only 31.6 percent of subjects in this study were male. This is also consistent with the Zylstra

(1992) and Kennedy (1992) studies who also noted a larger percentage of female than male participants.

Black participants (n=66) had the highest mean score, 4.0. Native Americans (n=76) had the lowest mean score, 2.8. White participants (n=444) had a mean score of 2.9. Results of studies by Kennedy (1992) and Zylstra (1992) were consistent with these findings, in that Black participants had higher nutritional risk scores than whites. See Table II.

Information obtained in this study, and supported by similar studies, indicates that persons less than 60 years of age, female, and Black tend to be at greater nutritional risk than their counterparts.

#### Living situation, receipt of financial assistance and length of participation

Participants living alone reported a higher mean score, 3.4, than those participants not living alone, mean score 2.4. Again, this finding was consistent with Zylstra (1992) and Kennedy (1992). These studies showed persons living alone had mean scores higher than persons not living alone.

Subjects receiving financial assistance reported a mean score of 3.7 compared to 2.7 for subjects not receiving financial assistance. This was consistent with the Zylstra (1992) and Kennedy (1992) studies which also showed that low income individuals had higher mean scores.

Subjects who had participated in the Tulsa Senior Nutrition program for greater than 3 years had a mean score of 2.8. Subjects who had participated in the program less than 6 months had a mean score of 3.6. Zylstra (1992) found that subjects participating from 6 months to three years had the highest mean score, 3.47, followed by those participating less than 6 months with a mean score of 3.24. These findings were consistent with the results of the Zylstra (1992) study in that those who had participated longer than

three years had the lowest mean score, 3.22. Kennedy also found that subjects participating less than 6 months had the highest mean score, 6.28.

Interestingly, in the Kennedy (1992) study, the group with the lowest mean score, 4.25, had participated from 7 months to 3 years. Subjects participating longer than three years received a mean score of 4.75. (See Table II).

Living alone and having low income appear to increase nutritional risk in the elderly. Participation in the elderly nutrition program for an extended period of time, longer than 6 months, seems to decrease the incidence of nutritional risk factors.

#### Responses to Nutritional Risk Statements

Nutritional risk responses are reported in descending order according to the frequency and percent of each response. The most prevalent nutritional risk factors reported by the subjects was eating alone most of the time. This was reported by 275 subjects (46.1%). Taking three or more prescribed or over the counter medications was reported by 259 subjects (43.5%). Having an illness or disease that caused a change in the amount or kind of food eaten was reported by 202 subjects (33.9%). Ninety-seven subjects (16.3%), reported eating few fruits, vegetables, or milk products daily. Unwanted weight loss or gain in the last 6 months was reported by 73 subjects (12.2%). Tooth or mouth problems were reported by 67 subjects (11.2%). Sixty-two subjects (10.4%), reported not being able to shop, cook and/or feed themselves. Eating only one meal per day and not having enough money to buy food needed were both reported by 33 subjects (5.5%). Only 8 subjects (1.3%) reported consuming three or more alcoholic drinks each day. The questions regarding alcohol intake and not having enough money to buy food may have been considered very personal by the subjects and, therefore, the responses may not be valid.

TABLE II  
 NUTRITIONAL RISK MEAN SCORES ACCORDING TO  
 DEMOGRAPHIC VARIABLES  
 N= 596\*

Personal Variables	N***	%**	Nutritional Risk Mean Score
<b>Age (Years)</b>			
Below 60	13	2.2	4.5
60-64	46	7.9	3.7
65-74	211	36.1	2.9
75-84	245	41.9	2.8
85 +	70	12.0	3.3
Total	585	100.1	
<b>Gender</b>			
Male	188	31.6	2.6
Female	407	68.4	3.2
Total	595	100.0	
<b>Race</b>			
White	444	75.3	2.9
Black	66	11.1	4.0
Native American	76	12.8	2.8
Total	586	99.2	
<b>Living Situation</b>			
One Person	305	54.7	3.4
More than one person	253	45.3	2.4
Total	558	100.0	
<b>Financial Assistance</b>			
Persons Receiving	161	29.4	3.7
Persons Not Receiving	386	70.6	2.7
Total	547	100.0	
<b>Length of Participation</b>			
0-6 Months	92	16.4	3.6
7 Months-3 Years	169	30.1	2.9
3+ Years	300	53.4	2.8
Total	561	99.9	

\*N=596 based on the number of useable responses

\*\*May not equal 100 % due to rounding

\*\*\* N for each question varies due to item non-response

### Nutritional Risk and Age

The majority of subjects in this study were 65-84 years of age. In fact, 456 (79.0%), of the 596 subjects in the study were in the age categories of 65-74 years of age and 75-84 years of age.

Subjects 65-74 years of age (211, 36.1%) most often reported eating few fruits, vegetables or milk products each day (35, 5.6%). This same group reported tooth or mouth problems that made it hard for them to eat (29, 45.0%), and not always having enough money to buy the food they needed (11, 1.9%). Subjects 65-74 years of age were the primary group which reported consuming 3 or more alcoholic drinks each day (5, 0.9%).

Subjects 75-84 years of age (245, 41.9%) most often reported taking 3 or more prescribed or over the counter medications (117, 20.0%). This age group also reported eating alone most of the time (115, 19.7%), having an illness that limits food choices (115, 19.7%), and having unwanted weight fluctuations in the last 6 months (25, 4.3%). Other risk factors most often reported by subjects 75-84 years of age were not being able to shop, cook, and feed themselves (23, 3.9%), and eating only one meal per day (15, 2.6%).

The most frequently reported nutritional risk factors according to age were taking three or more prescribed or over the counter medications, eating alone most of the time, and having an illness that limits food choice. All of these risk factors were most often reported by subjects 75-84 years of age. This age group may need to be specifically targeted for frequent nutrition screening. (See Table III).

### Nutritional Risk and Gender

Female participants were most likely to report eating alone most of the time (222, 37.3%). They were also more likely to report taking 3 or more prescribed or over the counter medications (189, 31.8%), having an illness that limits food choices (146, 24.5%), and eating few fruits, vegetables and milk products each day (64, 10.8%). Females were

TABLE III  
 FREQUENCY AND PERCENT OF RESPONSES TO NUTRITIONAL RISK  
 STATEMENTS ACCORDING TO AGE  
 N = 585\*

Risk Statements	Below 60		(60-64)		(65-74)		(75-84)		(85+)		Total	
	n=13		n=46		n=211		n=245		n=70		F % **	
	F	%	F	%	F	%	F	%	F	%	F	%
1. Illness limits food choices												
YES	4	0.7	27	4.6	73	12.5	77	13.2	17	2.9	198	33.9
NO	9	1.5	19	3.3	138	23.6	168	28.7	53	9.1	387	66.2
2. Eats only one meal/day												
YES	1	0.2	4	0.7	11	1.9	15	2.6	1	0.2	32	5.6
NO	12	2.1	42	7.2	200	34.2	230	39.3	69	11.8	553	94.6
3. Eat few fruits, vegetable or dairy												
YES	6	1.0	5	0.9	35	6.0	32	5.5	5	2.6	93	16.0
NO	7	1.2	41	7.0	176	30.1	213	36.4	55	9.4	492	84.1
4. Three or more alcoholic drinks												
YES	0	0.0	1	0.2	5	0.9	1	0.2	1	0.2	8	1.5
NO	13	2.2	45	7.7	206	35.2	244	41.7	69	11.8	577	98.6
5. Tooth or mouth problems												
YES	1	0.2	5	0.9	29	45.0	26	4.4	6	1.0	67	11.5
NO	12	2.1	41	7.0	182	31.1	219	37.4	64	10.9	518	88.5
6. Not enough money for food												
YES	3	0.5	6	1.0	11	1.9	9	1.5	3	0.5	32	5.5
NO	10	1.7	40	6.8	200	34.2	236	40.3	67	11.5	553	94.5

TABLE III continued

Risk Statements	Below 60		(60-64)		(65-74)		(75-84)		(85+)		Total	
	n=13		n=46		n=211		n=245		n=70			
	F	%	F	%	F	%	F	%	F	%	F	% **
7. Eat alone most of the time												
YES	4	0.7	21	3.6	84	14.4	115	19.7	46	7.9	270	46.3
NO	9	1.5	25	4.3	127	21.7	130	22.2	24	4.1	315	53.8
8. Three or more RX or OTC												
YES	7	1.2	19	3.3	80	13.7	117	20.0	33	5.6	256	43.8
NO	6	1.0	27	4.6	131	22.4	128	21.9	37	6.3	329	56.2
9. Unwanted weight loss or gain												
YES	4	0.7	7	1.2	24	4.1	25	4.3	11	1.9	71	12.2
NO	9	1.5	39	6.7	187	32.0	220	37.6	59	10.1	514	87.9
10. Unable to shop, cook, feed self												
YES	1	0.2	2	0.3	18	3.1	23	3.9	18	3.1	62	10.6
NO	12	2.1	44	7.5	193	33.0	222	38.0	52	8.9	523	89.5

\*N=585 based on number of useable responses

\*\* May not equal 100.0% due to rounding



also more likely to report unwanted weight fluctuations in the last 6 months (58, 9.8%), not being able to shop, cook and/or feed themselves (47, 7.9%), and have tooth or mouth problems that made it hard for them to eat (47, 7.9%). Finally, females were more likely to report eating only one meal per day (22, 3.7%), and not having enough money to buy the food they needed (20, 3.4%). Male participants were only more likely to report consuming 3 or more alcoholic drinks each day (2, 0.3%). (See Table IV).

### Nutritional Risk and Race

The majority of subjects in this study were White (444, 75.3%). Seventy six participants (12.8%) were Native Americans followed by Blacks with 66 participants (11.1%). White participants more often reported all nutritional risk factors. This is likely due to the majority of participants being White. The discussion of nutritional risk and race will focus on the Native Americans and Blacks since their group sizes were similar, 76 and 66 respectively. (See Table V).

Native Americans were more likely to report taking 3 or more prescribed or over the counter medications (34, 5.8%) than Blacks (28, 4.8%). Native Americans were also more likely to report eating alone most of the time (33, 5.6%), and eating few fruits, vegetables or dairy products each day (15, 2.6%) compared to Black participants (32, 5.5%) and (14, 2.4%) respectively.

Black participants were most likely to report having tooth or mouth problems that made it hard to eat (13, 2.2%) compared to Native Americans (8, 1.4%). Blacks were also more likely to report not having enough money to buy the food they needed (10, 1.7%), eating only one meal per day (9, 1.5%), and not being able to shop, cook, and/or feed themselves (8, 1.4%) compared to Native American participants (2, 0.3%), (4, 0.7%) and (3, 0.5%) respectively. Blacks more often reported consuming 3 or more alcoholic drinks

TABLE IV  
 FREQUENCY AND PERCENT OF RESPONSES TO NUTRITIONAL RISK  
 STATEMENTS ACCORDING TO GENDER  
 N=595\*

	Male (n=188)		Female (n=407)		Total	
	F	%	F	%	F	%**
1. Illness limits food choices						
YES	56	9.4	146	24.5	202	33.9
NO	132	22.2	261	43.9	393	66.1
2. Eats only one meal/day						
YES	11	1.9	22	3.7	33	5.6
NO	177	29.8	385	64.7	562	94.5
3. Eat few fruits, vegetables or dairy						
YES	33	5.6	64	10.8	97	16.4
NO	155	26.1	343	57.7	498	83.8
4. Three or more alcoholic beverages						
YES	6	1.0	2	0.3	8	1.3
NO	182	30.6	405	68.1	587	98.7
5. Tooth or mouth problems						
YES	20	3.4	47	7.9	67	11.3
NO	168	28.2	360	60.5	528	88.7
6. Not enough money for food						
YES	13	2.2	20	3.4	33	5.6
NO	175	29.4	387	65.0	562	94.4
7. Eat alone most of the time						
YES	53	8.9	222	37.3	275	46.2
NO	135	22.7	185	31.1	320	53.8
8. Three or more RX or OTC						
YES	69	11.6	189	31.8	258	43.4
NO	119	20.0	218	36.6	337	56.6
9. Unwanted weight loss or gain						
YES	15	2.5	58	9.8	73	12.3
NO	173	29.1	349	58.7	522	87.8
10. Unable to shop, cook, feed self						
YES	15	2.5	47	7.9	62	10.4
NO	173	29.1	360	60.5	533	89.6

\*N=595 based on number of useable responses

\*\* May not equal 100.0% due to rounding

TABLE V  
 FREQUENCY AND PERCENT OF RESPONSES TO NUTRITIONAL RISK  
 STATEMENTS ACCORDING TO RACE  
 N = 586\*

Risk Statements	White (n=444)		Black (n=66)		N. American (n=76)		Total	
	F	%	F	%	F	%	F	%**
1. Illness limits food choices								
YES	150	25.6	23	3.9	26	4.4	199	33.9
NO	294	50.2	43	7.3	50	8.5	387	66.0
2. Eats only one meal/day								
YES	20	3.4	9	1.5	4	0.7	33	5.6
NO	424	72.4	57	9.7	72	12.3	553	94.4
3. Eat few fruits, vegetables or dairy								
YES	64	10.9	14	2.4	15	2.6	93	15.9
NO	380	64.9	52	8.9	61	10.4	493	84.2
4. Three or more alcoholic drinks								
YES	6	1.0	2	0.3	0	0.0	8	1.3
NO	438	74.7	64	10.9	76	13.0	578	98.6
5. Tooth or mouth problems								
YES	44	7.5	13	2.2	8	1.4	65	11.1
NO	400	68.3	53	9.0	68	11.6	521	88.9
6. Not enough money for food								
YES	20	3.4	10	1.7	2	0.3	32	5.5
NO	424	72.4	56	9.6	74	12.4	554	94.5
7. Eat alone most of the time								
YES	203	34.6	32	5.5	33	5.6	268	45.7
NO	241	41.1	34	5.8	43	7.3	318	54.2
8. Three or more RX or OTC								
YES	191	32.6	28	4.8	34	5.8	253	43.2
NO	253	43.2	38	6.5	42	7.2	333	56.9
9. Unwanted weight loss or gain								
YES	52	8.9	10	1.7	10	1.7	72	12.3
NO	392	66.9	56	9.6	66	11.3	514	87.8
10. Unable to shop, cook or feed self								
YES	50	8.5	8	1.4	3	0.5	61	10.4
NO	394	67.2	58	9.9	73	12.5	525	89.6

\*N=586 based on number of useable responses

\*\* May not equal 100.0% due to rounding

per day (2, 0.3%) compared to Native Americans (0, 0.00%). Both racial groups reported equal numbers of subjects who had undesired weight fluctuations in the last 6 months (10, 1.7%).

Native Americans were more likely to take 3 or more prescribed or over the counter medications. Both Blacks and Native Americans appeared to be at similar nutritional risk due to eating alone most of the time and consuming few fruits, vegetables or milk products each day. (See Table V).

#### Nutritional Risk and Living Situation

Subjects in this study were more likely to live alone (305, 54.7%) than to live with someone else (253, 45.3%). Although the group sizes were similar, subjects living alone more often reported suffering from all of the nutritional risk factors studied. (See Table I).

Subjects living alone most often reported eating alone most of the time (220, 39.45%) compared to subjects living with someone else (29, 5.2%). Subjects living alone were more likely to report taking 3 or more prescribed or over the counter drugs (151, 27.1%), having an illness that limits food choice (100, 17.9%), and eating few fruits, vegetables or milk products (17, 3.0%) compared to subjects living with someone else, the responses were (97, 17.4%), (92, 16.5%) and (13, 2.3%) respectively. Subjects living alone were twice as likely to report not being able to shop, cook and/or feed themselves (40, 7.2%) as subjects living with someone else (20, 3.6%). Undesired weight fluctuations (38, 6.8%), having tooth or mouth problems that made it hard to eat (38, 6.8%), and not having enough money to buy the food they needed were reported more often by persons living alone compared to subjects living by themselves, the responses to these risk factors were (28, 5.0%), (23, 4.1%), and (11, 1.9%) respectively. Subjects living alone were also more likely to report eating only one meal per day (17, 3.0%) compared to (13, 2.3%) by subjects living with someone else. Both groups had four subjects (0.7%) report consuming three or more alcoholic drinks each day. (See Table VI).

TABLE VI  
 FREQUENCY AND PERCENT OF RESPONSES TO NUTRITIONAL RISK  
 STATEMENTS ACCORDING TO LIVING SITUATION  
 N = 558\*

Risk Statements	Live Alone (n = 305)		Live with someone (n = 76)		F	Total %**
	F	%	F	%		
1. Illness limits food choices						
YES	100	17.9	92	16.5	192	34.4
NO	205	36.7	161	28.9	366	65.6
2. Eats only one meal/day						
YES	17	3.0	13	2.3	30	5.3
NO	288	51.6	240	43.0	528	94.6
3. Eat few fruits, vegetables or dairy						
YES	49	8.8	37	6.6	86	15.4
NO	256	45.9	216	38.7	472	84.6
4. Three or more alcoholic drinks						
YES	4	0.7	4	0.7	8	1.4
NO	301	53.9	249	44.6	550	98.5
5. Tooth or mouth problems						
YES	38	6.8	23	4.1	61	10.9
NO	267	47.9	230	41.2	497	89.1
6. Not enough money for food						
YES	21	3.8	11	1.9	32	5.7
NO	284	50.9	242	43.4	526	94.3
7. Eat alone most of the time						
YES	220	39.4	29	5.2	249	44.6
NO	85	15.2	224	40.1	309	55.3
8. Three or more RX or OTC						
YES	151	27.1	97	17.4	248	44.5
NO	154	27.6	156	28.0	310	55.6
9. Unwanted weight loss or gain						
YES	38	6.8	28	5.0	66	11.8
NO	267	47.9	225	40.3	492	88.2
10. Unable to shop, cook or feed self						
YES	40	7.2	20	3.6	60	10.8
NO	265	47.5	233	41.8	498	89.3

\*N=558 based on number of useable responses

\*\* May not equal 100.0% due to rounding

The number of subjects who reported living alone was similar to those who reported living with someone else. However, subjects living alone reported each nutritional risk factor more often than subjects living with someone else. This showed that living alone is a major risk factor when nutritional risk factors are considered. The most obvious differences between the two groups were in eating alone most of the time, not being able to shop, cook and/or feed themselves, not having enough money to buy the food they needed, and in taking 3 or more prescribed or over the counter medications each day.

#### Nutritional Risk and Receipt of Financial Assistance

The majority of the subjects in this study did not receive financial assistance in the form of SSI, Medicaid or Foodstamps (386, 70.6%). The remaining 161 subjects (29.4%) reported receiving financial assistance in one of these three forms. Subjects not receiving financial assistance had a higher incidence of nutritional risk factors.

Subjects not receiving financial assistance most often reported eating alone most of the time (162, 29.6%). This group also reported that they more often took 3 or more prescribed or over the counter medications (155, 28.3%), had an illness that limits food choice (125, 22.9%), and ate few fruits, vegetables or milk products (56, 10.2%). Subjects not receiving financial assistance were more likely to report not being able to shop, cook and/or feed themselves (44, 8.0%), having undesired weight changes in the last 6 months (41, 7.5%), and having tooth or mouth problems that made it hard for them to eat (37, 6.8%).

Subjects receiving financial assistance were more likely to report not having enough money to buy the food they needed (18, 3.3%). They were also more likely to report eating only one meal per day (15, 2.7%).

Eating alone most of the time, taking three or more prescribed or over the counter medications, and having an illness that limits food choice were the most prevalent nutritional risks among subjects not receiving financial assistance. However, 70.6% of the

subjects in this study did not receive financial assistance. It is possible that this skewed these results. It is very important to note the findings among the group that received financial assistance. They were more likely to not have enough money to buy the food they needed and eat only one meal per day. Due to the number of persons receiving financial assistance (161, 29.4%), low income appears to have an impact on nutritional risk. (See Table VII).

#### Nutritional Risk and Length of Participation in Nutrition Program

The majority of the subjects in this study had participated in the Tulsa Senior Nutrition Program longer than 3 years (300, 53.4%), followed by those participating 7 months - 3 years (169, 30.1%), and those participating for less than 6 months (92, 16.4%). All nutritional risk statements were most often reported by subjects who had participated in the program longer than 3 years. This is likely due to the large number of subjects in this group. For this reason, comparisons will be made between subjects participating 0-6 months and 7 months-3 years. (See Table VIII).

Subjects who had participated less than 6 months were more likely to report not being able to shop, cook and/or feed themselves (21, 3.7%). They were also more likely to report tooth or mouth problems that made it hard for them to eat (16, 2.9%).

Subjects who had participated from 7 months-3 years were more likely to report eating alone most of the time (75, 13.4%), taking 3 or more prescribed or over the counter medications (74, 13.2%), and having an illness that limits food choice (60, 10.7%). These subjects were also more likely to report eating few fruits, vegetables or milk products (26, 4.6%), having undesired weight fluctuations in the last 6 months (19, 3.4%), eating only one meal per day (11, 2.0%), and not having enough money to buy the food they needed (10, 1.8%). Consuming 3 or more alcoholic drinks each day was also reported most often by subjects participating from 7 months-3 years (2, 0.4%). (See Table VIII).

TABLE VII  
 FREQUENCY AND PERCENT OF RESPONSES TO NUTRITIONAL RISK  
 STATEMENTS ACCORDING TO RECEIPT OF  
 FINANCIAL ASSISTANCE  
 N = 547\*

Risk Statement	Don't receive assistance (n = 386)		Receive assistance (n = 161)		Total	
	F	%	F	%	F	%**
1. Illness limits food choices						
YES	125	22.9	65	11.9	190	34.8
NO	261	47.7	96	17.6	357	65.3
2. Eats only one meal/day						
YES	13	2.4	15	2.7	28	5.1
NO	373	68.2	146	26.7	519	94.9
3. Eats few fruits, vegetables or dairy						
YES	56	10.2	30	5.5	86	15.7
NO	330	60.3	131	24.0	461	84.3
4. Three or more alcoholic drinks						
YES	6	1.1	2	0.4	8	1.5
NO	380	69.5	159	29.1	539	98.6
5. Tooth or mouth problems						
YES	37	6.8	24	4.4	61	11.2
NO	349	63.8	137	25.1	486	88.9
6. Not enough money for food						
YES	13	2.4	18	3.3	31	5.7
NO	373	68.2	143	26.1	516	94.3
7. Eat alone most of the time						
YES	162	29.6	83	15.2	245	44.8
NO	224	41.0	78	14.3	302	55.3
8. Three or more RX or OTC						
YES	155	28.3	84	15.4	239	43.7
NO	231	42.2	77	14.1	308	56.3
9. Unwanted weight loss or gain						
YES	41	7.5	22	4.0	63	11.5
NO	345	63.1	139	25.4	484	88.5
10. Unable to shop, cook or feed self						
YES	44	8.0	15	2.7	59	10.7
NO	342	62.5	146	26.7	488	89.2

\*N= 547 based on number of useable responses

\*\* May not equal 100.0% due to rounding



**TABLE VIII**  
**FREQUENCY AND PERCENT OF RESPONSES TO NUTRITIONAL RISK**  
**STATEMENTS ACCORDING TO LENGTH OF PARTICIPATION**  
**IN SENIOR NUTRITION PROGRAM**  
**N = 561\***

Risk Statements	0-6 months (n=92)		7months-3 yrs (n=169)		3+years (n=300)		Total	
	F	%	F	%	F	%	F	%**
1. Illness limits food choices								
YES	32	5.7	60	10.7	95	16.9	187	33.3
NO	60	10.7	109	19.4	205	36.5	374	66.6
2. Eats only one meal/day								
YES	5	0.9	11	2.0	13	2.3	29	5.2
NO	87	15.5	158	28.2	287	51.2	532	94.9
3. Eat few fruits, vegetables or dairy								
YES	14	2.5	26	4.6	52	9.3	92	16.4
NO	78	13.9	143	25.5	248	44.2	469	83.6
4. Three or more alcoholic drinks								
YES	1	0.2	2	0.4	5	0.9	8	1.5
NO	91	16.2	167	29.8	295	52.6	553	98.6
5. Tooth or mouth problems								
YES	16	2.9	14	2.5	32	5.7	62	11.1
NO	76	13.6	155	27.6	268	47.8	499	89.0
6. Not enough money for food								
YES	9	1.6	10	1.8	12	2.1	31	5.5
NO	83	14.8	159	28.3	288	51.3	530	94.4
7. Eat alone most of the time								
YES	43	7.7	75	13.4	137	24.4	255	45.5
NO	49	8.7	94	16.8	163	51.3	306	54.5
8. Three or more RX or OTC								
YES	38	6.8	74	13.2	133	23.7	245	43.7
NO	54	9.6	95	16.9	167	29.7	316	56.3
9. Unwanted weight loss or gain								
YES	15	2.7	19	3.4	30	5.4	64	11.5
NO	77	13.7	150	26.7	270	48.1	497	88.5
10. Unable to shop, cook, feed self								
YES	21	3.7	13	2.3	26	4.6	60	10.6
NO	71	12.7	156	27.8	274	48.8	501	89.3

\*N=561 based on number of useable responses

\*\*May not equal 100.0% due to rounding

There were 169 subjects (30.1%) in the group that had participated in the Tulsa Senior Nutrition Program from 7 months-3 years, but, only 92 subjects (16.4%) in the group that had participated less than 6 months. This could be a reason for the majority of the nutritional risk statements being more often reported by the group which had participated from 7 months-3years. The major nutritional risks reported in this group were eating alone most of the time, taking three or more prescribed or over the counter medications, and having an illness that limits food choice. Those participating less than 6 months most often reported not being able to shop, cook and/or feed themselves, and having tooth or mouth problems that made it hard for them to eat. Hopefully by continued participation in the nutrition program these needs can be addressed and corrected, thus reducing the nutritional risk of these subjects.

### Statistical Analyses

Analysis of Variance, t-test's, Duncan's multiple range tests and Chi-squares were used to test the hypotheses in the study. The significance level was set at  $p \leq 0.05$ .

#### Testing of Ho 1:

Ho 1: There will be no significant relationship between age and nutritional risk of participants.

Results of Duncan's multiple range test and analysis of variance (ANOVA) showed that subjects less than 60 years of age had significantly higher nutritional risk scores,  $p = 0.0403$ . Chi-square analyses identified that subjects 60-64 years of age were significantly more likely to have an illness that limits food choice ( $p=0.003$ ). Subjects less than 60 years of age reported significantly less consumption of fruits, vegetables and milk products daily ( $p=0.012$ ). Subjects less than 60 years of age and 60-64 years of age were significantly more likely to report not having enough money to buy the food they need ( $p=0.006$ ). Subjects 85 years or older were significantly more likely to report eating alone

most of the time ( $p=0.004$ ) and not be able to shop, cook and/or feed themselves ( $p=0.000$ ). Due to these findings the researcher rejected Ho 1. (See Tables IX, X and XI).

According to these findings regarding age and nutritional risk, subjects less than 60 years of age and subjects 85 years of age or older are at significantly higher nutritional risk than subjects in the other age groups. Also, subjects 60-64 years of age are at significant nutritional risk when they do not have enough money to buy the food they need. It seems that the younger subjects and the oldest subjects are at the highest nutritional risk. The subjects from 65-74 years of age and 75-84 years of age were at the least nutritional risk.

#### Testing of Ho 2:

Ho 2: There will be no significant relationship between gender and nutritional risk of participants.

Chi-square analyses identified that males were significantly more likely to report consuming three or more alcoholic drinks each day ( $p=0.008$ ). However, only 8 of the 595 participants answered "yes" to this question. Due to the small number of responses, chi-square may not be a valid analysis. Chi-square results showed females were significantly more likely to report eating alone most of the time ( $p=0.000$ ) and taking 3 or more prescribed or over the counter medications ( $p=0.026$ ). Due to these findings the researcher rejected Ho 2. (See Table IX).

#### Testing of Ho3:

Ho 3: There will be no significant relationship between race and nutritional risk of participants.

TABLE IX  
 CHI-SQUARE DETERMINATIONS INDICATING ASSOCIATIONS  
 BETWEEN NUTRITIONAL RISK STATEMENTS AND  
 SELECTED PERSONAL VARIABLES  
 N=596\*

Nutritional Risk Statements	Age	Gender	Race	Living Situation	Income	Participation Time
<u>Illness limits food choice</u>						
X <sup>2</sup>	16.29	2.12	0.03	0.78	3.20	0.82
d f	4	1	2	1	1	2
p	**0.00	0.15	0.98	0.38	0.07	0.66
<u>Eat only one meal/day</u>						
X <sup>2</sup>	3.49	0.05	9.04	0.05	8.28	1.06
d f	4	1	2	1	1	2
p	0.59	0.48	0.83	**0.01	0.82	**0.00
<u>Eat few fruits/veg/milk</u>						
X <sup>2</sup>	12.92	0.32	2.97	0.22	1.46	0.41
d f	4	1	2	1	1	2
p	**0.02	0.58	0.23	0.64	0.23	0.81
<u>Three or more alcoholic drinks each day</u>						
X <sup>2</sup>	3.65	7.07	2.41	0.07	0.08	0.27
d f	4	1	2	1	1	2
p	0.46	**0.01	0.30	0.79	0.78	0.87
<u>Tooth/Mouth problems</u>						
X <sup>2</sup>	2.03	0.11	5.61	1.61	3.25	5.12
d f	4	1	2	1	1	2
p	0.73	0.74	0.06	0.20	0.07	0.08

TABLE IX Continued

Nutritional Risk Statements	Age	Gender	Race	Living Situation	Income	Participation Time
<u>Not enough money for food</u>						
X <sup>2</sup>	14.64	0.98	13.97	1.65	12.97	4.58
d f	4	1	2	1	1	2
p	**0.01	0.32	**0.00	0.20	**0.00	0.10
<u>Eat alone most of the time</u>						
X <sup>2</sup>	15.50	35.93	0.37	205.98	4.22	0.15
d f	4	1	2	1	1	2
p	**0.00	**0.00	0.83	**0.00	**0.04	0.93
<u>Three or more prescribed or over the counter drugs/day</u>						
X <sup>2</sup>	5.49	4.96	0.10	6.99	6.67	0.26
d f	4	1	2	1	1	2
p	0.24	**0.03	0.95	**0.01	**0.01	0.88
<u>Unwanted weight loss/gain</u>						
X <sup>2</sup>	6.46	4.70	0.69	0.26	1.03	2.78
d f	4	1	2	1	1	2
p	0.17	**0.03	0.71	0.61	0.31	0.25
<u>Unable to shop/cook/feed self</u>						
X <sup>2</sup>	20.22	1.76	3.96	3.91	0.51	17.06
d f	4	1	2	1	1	2
p	**0.00	0.19	0.14	**0.05	0.47	**0.00

\*N=596 based on number of useable responses

\*\* = Significant at  $p \leq 0.05$

TABLE X  
ANALYSIS OF VARIANCE (ANOVA) RESULTS FOR AGE  
AND NUTRITIONAL RISK MEAN SCORE  
N=585\*

Source	df	Mean Square	F	p
Age	4	17.57	2.52	0.04
Error	580	6.97		
Total	584			

\*N=585 based on number of useable responses

TABLE XI  
DUNCAN'S MULTIPLE RANGE TEST FOR SELECTED  
PERSONAL VARIABLES AND NUTRITIONAL  
RISK MEAN SCORE  
N=596\*

Personal Variables	N**	Mean Score	Grouping***
Age			
Below 60	13	4.462	A
60-64	46	3.696	AB
85 +	70	3.286	AB
65-74	211	2.886	B
75-84	245	2.780	B
Race			
Blacks	66	4.045	A
White	444	2.851	B
Native American	76	2.776	B
Participation Time			
0-6 Months	92	3.587	A
7 Months-3 Years	169	2.899	B
3 + Years	300	2.790	B

\* N=596 based on the number of useable responses

\*\* N for each personal variable varies due to item non-response

\*\*\*Means with the same letter are not significant at the  $p=0.05$  level

Results of Duncan's multiple range test and ANOVA showed that Blacks had a significantly higher mean nutritional risk score, 4.0, than Whites or Native Americans with scores of 2.9 and 2.8 respectively ( $p=0.0022$ ). Chi-square analysis identified that Blacks were significantly more likely to report eating only one meal per day ( $p=0.011$ ) and not having enough money to buy the food they need ( $p=0.001$ ). Due to these findings the researcher rejected Ho 3. (See Tables IX, XI and XII).

TABLE XII  
ANALYSIS OF VARIANCE (ANOVA) RESULTS FOR RACE  
AND NUTRITIONAL RISK MEAN SCORE  
N=586\*

Source	df	Mean Square	F	p
Race	2	42.71	6.18	0.00
Error	583	6.91		
Total	585			

\*N=586 based on number of useable responses

The only significant relationships between nutritional risks and race were among Black subjects. No significant relationships were identified for Whites or Native Americans. From these results it is evident that Blacks ( $n=66$ ) are at significantly higher nutritional risk than Whites or Native Americans.

#### Testing of Ho 4:

Ho 4: There will be no significant relationship between living situation and nutritional risk of participants.

Chi-square analysis identified that persons living alone were significantly more likely to report eating alone most of the time ( $p=0.000$ ), taking three or more prescribed or

over the counter medications ( $p=0.008$ ) and not being able to shop, cook and/or feed themselves ( $p=0.048$ ). Due to these findings the researcher rejected Ho 4. (See Table IX).

No significant findings were noted for subjects living with someone else. These results show that living situation, especially living alone, is a significant nutritional risk for malnutrition.

#### Testing of Ho 5:

Ho 5: There will be no significant relationship between receipt of financial assistance and nutritional risk of participants.

The t-test results identified a significant relationship between receipt of financial assistance in the form of SSI, Medicaid or Foodstamps and the nutritional risk score. Subjects receiving assistance had a significantly higher nutritional risk score, 3.7, compared to those not receiving assistance whose mean score was 2.7, ( $p=0.0156$ ). Results of Chi-square analysis showed that persons receiving assistance were significantly more likely to report eating only one meal per day ( $p=0.004$ ), not having enough money to buy the food they need ( $p=0.000$ ), eating alone most of the time ( $p=0.0440$ ) and taking three or more prescribed or over the counter medications ( $p=0.010$ ). Based on these findings the researcher rejected Ho 5. (See Tables IX and XIII).

Receipt of financial assistance in the form of SSI, Medicaid or Foodstamps was linked to numerous significant nutritional risks. However, responses from subjects not receiving financial assistance were not significant. These results show that subjects with low income levels are significantly more likely to be at nutritional risk than subjects who are not low income.

#### Testing of Ho 6:

Ho 6: There will be no significant relationship between length of participation in the Tulsa Senior Nutrition Program and nutritional risk of participants.



TABLE XIII  
T-TEST DETERMINATION ON PERSONAL VARIABLES  
BY NUTRITIONAL RISK MEAN SCORE  
N=596\*

Personal Variables	N**	Mean	SD	p-value***
<u>Gender</u>				
Female	407	3.16	2.62	0.032
Male	188	2.64	2.74	
<u>Living Situation</u>				
One	305	3.42	2.77	0.000
More than One	253	2.44	2.51	
<u>Receipt of Financial Assistance</u>				
No assistance	386	2.66	2.53	0.000
Assistance	161	3.73	2.93	

\* N=596 based on the number of useable responses

\*\* N for each personal variable may vary due to item non-response

Results of Duncans multiple range test and ANOVA showed subjects participating in the Tulsa Senior Nutrition Program less than 6 months had a significantly higher nutritional risk score (3.6) than subjects participating for 7 months - 3 years (2.9) or more than 3 years (2.8), ( $p=0.0422$ ). Chi-square analysis identified that subjects participating less than six months were significantly more likely to report not being able to shop, cook and/or feed themselves ( $p=0.000$ ). Due to these significant findings the researcher rejected  $H_0 6$ . (See Tables IX, XII, XIV).

Participation time less than 6 months had a significant impact in terms of increasing nutritional risk. No significant findings were identified for subjects participating from 7 months-3 years or longer than 3 years. From these results, it appears that the longer someone participates in the nutrition program, the lower their nutritional risk.

TABLE XIV  
ANALYSIS OF VARIANCE (ANOVA) RESULTS FOR PARTICIPATION TIME  
AND NUTRITIONAL RISK MEAN SCORE  
N=561\*

Source	df	Mean Square	F	p
Participation Time	2	22.72	3.18	0.04
Error	558	7.14		
Total	560			

\* N=561 based on the number of useable responses

## CHAPTER V

### SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

#### Summary

The purpose of this study was to examine the nutritional risk factors among members of the Tulsa Senior Nutrition Program utilizing the "DETERMINE Your Nutritional Health" checklist. Six hypotheses were postulated to determine the significance of age, gender, race, living situation, receipt of financial assistance and length of participation on nutritional risk.

There were 4 objectives defined for this study, they were:

- 1) To identify the total nutritional risk scores of elderly using the "DETERMINE" Your Nutritional Health checklist.
- 2) To identify the relationship between nutritional risk and age, gender, race, living situation, receipt of financial assistance, and length of participation in the Tulsa Senior Nutrition Program.
- 3) To identify the prevalence of each nutritional risk included on the "DETERMINE Your Nutritional Health" checklist.
- 4) To identify suggestions and recommendations for nutrition education and policy

The sample included 596 participants of the Tulsa Senior Nutrition Program willing to take part in the study, who were present at the nutrition site the day the questionnaire was administered. Each participant completed the "DETERMINE" Your Nutritional Health checklist. The researcher was present to assist in the completion of the questionnaire, if needed. Scores from the checklist put subjects in one of three nutritional

risk categories. A score of 0-2 indicated a "good nutritional score" with little risk of malnutrition. A score of 3-5 indicated "moderate nutritional risk" while a score of 6 or more indicated "high nutritional risk" Data obtained was analyzed using frequencies, percentages, Student's t-tests, ANOVA, Duncan's Multiple Range Tests and Chi-squares.

The majority of the subjects (456, 78.0%) were 65-84 years of age. Most were white (444, 75.3%), female (407, 68.4%) and living alone (305, 54.7%). The majority were not receiving financial assistance in the form of SSI, Medicaid or Foodstamps(386, 70.6%), and had participated in the nutrition program longer than 3 years (300, 53.4%).

Participants below 60 years of age were at higher nutritional risk than the other age groups. Females had higher mean nutritional risk scores than males. Blacks were found to be more at risk than whites or Native Americans. Participants living alone, receiving financial assistance and participating in the program less than 6 months were at higher nutritional risk than their counterparts.

Participants 75-84 years of age, female, white, living alone, not low income who had participated in the Tulsa Senior Nutrition Program longer than 3 years were most likely to report having an illness that limits food choice. Subjects most likely to report eating only 1 meal per day were 75-84 years of age, female, white, living alone, low income who had participated in the Elderly Nutrition Program longer than 3 years. Participants 65 -74 years of age, female, white, living alone, not low income who had participated in the Elderly Nutrition Program longer than 3 years were most likely to report eating few fruits, vegetables or milk products. Those who reported consuming 3 or more alcoholic drinks each day were most often 65-74 years of age, male, white, not low income who had participated in the Elderly Nutrition longer than 3 years.

Participants with reported tooth or mouth problems were most often 65-74 years of age, female, white, living alone, not receiving financial assistance and participating longer than 3 years. Not having enough money to buy food was most often reported by

participants 65-74 years of age, female, white, living alone, not low income who had participated in the Elderly Nutrition Program longer than three years.

Eating alone most of the time, taking 3 or more prescribed or over the counter medications, experiencing unwanted weight loss or gain, and not being able to shop/cook or feed themselves were all most often reported by participants 75-84 years of age, female, white, living alone, not low income who had participated in the Elderly Nutrition Program longer than 3 years.

In summary, age, gender, race, living situation, receipt of financial assistance and length of participation time in the Tulsa Senior Nutrition Program, all were significantly related to nutritional risk. Despite demographics, the most often reported nutritional risk factors were eating alone most of the time, taking 3 or more prescribed or over the counter medications, and having an illness that limits food choice. Of these 3, eating alone most of the time was reported most often. Subjects who were Black, low income and living alone had the most significant nutritional risk factors. Kennedy (1992) also found that eating alone most of the time and being low income were two factors contributing to increased nutritional risk.

### Conclusions

Eating alone most of the time and being low income were 2 of the major nutritional risk factors identified in this study. Since the Elderly Nutrition Program offers the opportunity for its participants to receive a sound, nutritious meal for a reasonable suggested donation, it can be nutritionally and financially beneficial for low income participants. Also, since the meal is served in a group setting, it can provide much needed social interaction for participants who most often must eat alone. Subjects in this study who were identified to be at nutritional risk, either from being low income or from eating alone most of the time, are the ones who can benefit most by regularly attending the Tulsa Senior Nutrition Program.

## Implications

The following implications are presented as a result of this research:

- 1) Dietetics professionals should be proactive in promoting legislation to ensure adequate funding is available to continue the Older Americans Act and the Elderly Nutrition Program.
- 2) Dietetics professionals should take part in, and promote nutrition screening for persons at risk of malnutrition, especially the elderly.
- 3) Dietetics professionals should be active members of multi-disciplinary teams designed to help reduce the incidence of risk factors associated with malnutrition.

### Recommendations for Nutrition Education

- 1) Nutrition education provided at Elderly Nutrition Programs should be appropriate and easily applicable.
- 2) Nutrition education should be provided by qualified professionals such as registered dietitians.
- 3) Nutrition education should be geared toward ways of reducing the occurrence of nutritional risk factors such as cooking and eating for one person, food/medication interactions, and appropriate nutritional guideline for specific medical conditions such as hyper tension and hypercholesterolemia.

### Recommendations for Further Study

Recommendations for further research include:

- 1) To identify nutritional risk senior nutrition program participants receiving home-delivered meals; and elderly persons being visited by home health professionals.
- 2) To conduct longitudinal studies using Nutrition Screening Initiative tools to determine how effectively risk factors of malnutrition are corrected using a multi-disciplinary approach.

- 3) To revise the "DETERMINE Your Nutritional Health" checklist by a) rewording statements for clarity and b) breaking down multi-part statements into separate, one part statements each addressing a specific nutritional risk factor.
- 4) To analyze food intake records of the elderly to identify dietary inadequacies, and, conduct continuing education programs to educate participants on how to correct these dietary inadequacies.

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## APPENDIX

GET  
YOUR  
NUTRI  
HEALTH

APPENDIX A

## ORIGINAL QUESTIONNAIRE

*The Warning Signs of poor nutritional health are often overlooked. Use this checklist to find out if you or someone you know is at nutritional risk.*

Read the statements below. Circle the number in the yes column for those that apply to you or someone you know. For each yes answer, score the number in the box. Total your nutritional score.

# DETERMINE YOUR NUTRITIONAL HEALTH

	YES
I have an illness or condition that made me change the kind and/or amount of food I eat.	2
I eat fewer than 2 meals per day.	3
I eat few fruits or vegetables, or milk products.	2
I have 3 or more drinks of beer, liquor or wine almost every day.	2
I have tooth or mouth problems that make it hard for me to eat.	2
I don't always have enough money to buy the food I need.	4
I eat alone most of the time.	1
I take 3 or more different prescribed or over-the-counter drugs a day.	1
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	2
I am not always physically able to shop, cook and/or feed myself.	2
	<b>TOTAL</b>

### Total Your Nutritional Score. If it's —

- 0-2** **Good!** Recheck your nutritional score in 6 months.
- 3-5** **You are at moderate nutritional risk.** See what can be done to improve your eating habits and lifestyle. Your office on aging, senior nutrition program, senior citizens center or health department can help. Recheck your nutritional score in 3 months.
- 6 or more** **You are at high nutritional risk.** Bring this checklist the next time you see your doctor, dietitian or other qualified health or social service professional. Talk with them about any problems you may have. Ask for help to improve your nutritional health.

*These materials developed and distributed by the Nutrition Screening Initiative, a project of:*



AMERICAN ACADEMY  
OF FAMILY PHYSICIANS



THE AMERICAN  
DIETETIC ASSOCIATION



NATIONAL COUNCIL  
ON THE AGING, INC.

**Remember that warning signs suggest risk, but do not represent diagnosis of any condition. Turn the page to learn more about the Warning Signs of poor nutritional health.**

**WARNING SIGNS OF MALNUTRITION**  
(Backside of Original Questionnaire)

**The Nutrition Checklist is based on the Warning Signs described below.  
Use the word DETERMINE to remind you of the Warning Signs.**

**DISEASE**

Any disease, illness or chronic condition which causes you to change the way you eat, or makes it hard for you to eat, puts your nutritional health at risk. Four out of five adults have chronic diseases that are affected by diet. Confusion or memory loss that keeps getting worse is estimated to affect one out of five or more of older adults. This can make it hard to remember what, when or if you've eaten. Feeling sad or depressed, which happens to about one in eight older adults, can cause big changes in appetite, digestion, energy level, weight and well-being.

**EATING POORLY**

Eating too little and eating too much both lead to poor health. Eating the same foods day after day or not eating fruit, vegetables, and milk products daily will also cause poor nutritional health. One in five adults skip meals daily. Only 13% of adults eat the minimum amount of fruit and vegetables needed. One in four older adults drink too much alcohol. Many health problems become worse if you drink more than one or two alcoholic beverages per day.

**TOOTH LOSS/ MOUTH PAIN**

A healthy mouth, teeth and gums are needed to eat. Missing, loose or rotten teeth or dentures which don't fit well or cause mouth sores make it hard to eat.

**ECONOMIC HARDSHIP**

As many as 40% of older Americans have incomes of less than \$6,000 per year. Having less--or choosing to spend less--than \$25-30 per week for food makes it very hard to get the foods you need to stay healthy.

**REDUCED SOCIAL CONTACT**

One-third of all older people live alone. Being with people daily has a positive effect on morale, well-being and eating.

**MULTIPLE MEDICINES**

Many older Americans must take medicines for health problems. Almost half of older Americans take multiple medicines daily. Growing old may change the way we respond to drugs. The more medicines you take, the greater the chance for side effects such as increased or decreased appetite, change in taste, constipation, weakness, drowsiness, diarrhea, nausea, and others. Vitamins or minerals when taken in large doses act like drugs and can cause harm. Alert your doctor to everything you take.

**INVOLUNTARY WEIGHT LOSS/GAIN**

Losing or gaining a lot of weight when you are not trying to do so is an important warning sign that must not be ignored. Being overweight or underweight also increases your chance of poor health.

**NEEDS ASSISTANCE IN SELF CARE**

Although most older people are able to eat, one of every five have trouble walking, shopping, buying and cooking food, especially as they get older.

**ELDER YEARS ABOVE AGE 80**

Most older people lead full and productive lives. But as age increases, risk of frailty and health problems increase. Checking your nutritional health regularly makes good sense.



The Nutrition Screening Initiative, 2626 Pennsylvania Avenue, NW, Suite 301, Washington, DC 20037

The Nutrition Screening Initiative is funded in part by a grant from Ross Laboratories, a division of Abbott Laboratories.

## ADAPTED QUESTIONNAIRE

## DETERMINE YOUR NUTRITIONAL HEALTH

*The Warning Signs of poor nutritional health are often overlooked. Use this checklist to find out if you or someone you know is at nutritional risk.*

Read the statements below. Place a check next to the number in the YES column next to those statements that apply to your situation. If the statement does not apply, place a check in the NO box. Total your nutritional score.

	Yes	No
I have an illness or condition that made me change the kind or amount of food I eat.	2	
I eat only one meal per day.	3	
I eat two servings or less of fruits or vegetables or milk products every day.	2	
I have 3 or more drinks of beer, liquor, or wine almost every day.	2	
I have tooth or mouth problems that make it hard for me to eat.	2	
I don't always have enough money to buy the food I need.	4	
I eat alone most of the time.	1	
I take 3 or more prescribed or over-the-counter drugs a day.	1	
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	2	
I am not always physically able to shop, cook, and/or feed myself.	2	
TOTAL		X

TOTAL YOUR NUTRITIONAL SCORE. If it is--  
 0-2 GOOD! Recheck your score in 6 months.

3-5 YOU ARE AT MODERATE NUTRITIONAL RISK. Talk to your registered dietitian available through your Senior Nutrition Program to evaluate your eating habits and lifestyle. Your R.D. will want to recheck your score in 3 months.

6 or more YOU ARE AT HIGH NUTRITIONAL RISK. Your registered dietitian will want to ask you a few more questions to evaluate your nutritional health further. Talk with him/ her about any problems you may have. With your permission, the dietitian may want to share some of this information with your personal physician.



DEMOGRAPHIC DATA  
(Backside of Adapted Questionnaire)

DETERMINE YOUR NUTRITIONAL HEALTH

Is a VOLUNTARY health program sponsored by:  
The American Dietetic Association  
American Academy of Family Physicians  
National Council on Aging, Inc. &  
The Tulsa Senior Nutrition Program

*The information on this form is confidential and will be shared only with your own physician if the health care professional thinks you are at nutritional risk. The Registered Dietitian or Dietetic Intern will contact you before they contact your physician for your permission. Confidentiality is very important to us and will be maintained.*

General Information:

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Name nutrition site: \_\_\_\_\_

Home Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Physician's Name: \_\_\_\_\_

Physician's Address: \_\_\_\_\_

Date of Birth: \_\_\_\_\_

Age: Under 60 \_\_\_\_\_ 60-64 \_\_\_\_\_ 65-74 \_\_\_\_\_ 75-84 \_\_\_\_\_ 85+ \_\_\_\_\_

Gender: Male \_\_\_\_\_ Female \_\_\_\_\_

CHECK ONE: Hispanic: \_\_\_\_\_ Asian: \_\_\_\_\_ White: \_\_\_\_\_ Black: \_\_\_\_\_

Native American \_\_\_\_\_ Other \_\_\_\_\_ specify \_\_\_\_\_

How many people (including yourself) live in your household? One \_\_\_\_\_ More than one \_\_\_\_\_

Do you receive SSI, Medicaid or Food Stamps?

Yes \_\_\_\_\_ No \_\_\_\_\_

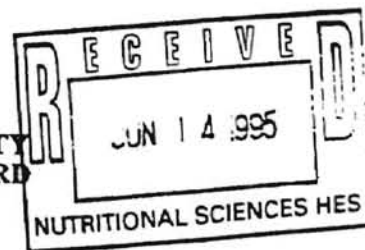
How long have you participated in the Senior Nutrition Program?

0-6 months \_\_\_\_\_ 7 months-3 years \_\_\_\_\_ 3+ years \_\_\_\_\_

Outreach worker's name (if applicable) \_\_\_\_\_

APPENDIX B

OKLAHOMA STATE UNIVERSITY  
INSTITUTIONAL REVIEW BOARD  
HUMAN SUBJECTS REVIEW



**Date:** 06-07-95

**IRB#:** HE-95-035

**Proposal Title:** NUTRITIONAL RISK FACTORS OF PARTICIPANTS IN THE  
TULSA SENIOR NUTRITION PROGRAM

**Principal Investigator(s):** Bernice Kopel, Gregory Thomas

**Reviewed and Processed as:** Exempt

**Approval Status Recommended by Reviewer(s):** Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD  
AT NEXT MEETING.

APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A  
CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD  
APPROVAL.

ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR  
APPROVAL.

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Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval  
are as follows:

Signature:

Chair of Institutional Review Board

Date: June 9, 1995

VITA <sup>2</sup>

Gregory E. Thomas

Candidate for the Degree of

Master of Science

**Thesis: IDENTIFICATION OF NUTRITIONAL RISK FACTORS AMONG THE MEMBERS OF THE TULSA SENIOR NUTRITION PROGRAM USING THE NUTRITION SCREENING INITIATIVE**

**Major Field: Nutritional Sciences**

**Biographical:**

**Personal Data:** Born in Tulsa, Oklahoma, March 26, 1969, the son of Larry and Merlene Thomas.

**Education:** Graduated from Memorial High School, Tulsa, Oklahoma, in May, 1987; received Bachelor of Science Degree in Food, Nutrition and Institution Administration in December 1991 from Oklahoma State University, Stillwater, Oklahoma; completed Approved Pre-Professional Practice Program at Oklahoma State University, May, 1993; passed registration exam to meet requirements for American Dietetic Association membership in October, 1993; completed requirements for the Master of Science Degree at Oklahoma State University in May, 1996

**Professional Experience:** Clinical Dietitian, Muskogee Regional Medical Center, Muskogee, Oklahoma, December 1993 to present.

**Professional Organizations:** American Dietetic Association, Oklahoma Dietetic Association.