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NUTRITIONAL KNOWLEDGE, ATTITUDES, AND BELIEFS
OF SELECTED OLDER ADULTS: A COMPARATIVE
STUDY.

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THE UNIVERSITY OF OKLAHOMA
GRADUATE COLLEGE

NUTRITIONAL KNOWLEDGE, ATTITUDES, AND
BELIEFS OF SELECTED OLDER ADULTS:
A COMPARATIVE STUDY

A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
in partial fulfillment of the requirements for the
degree of
DOCTOR OF PHILOSOPHY

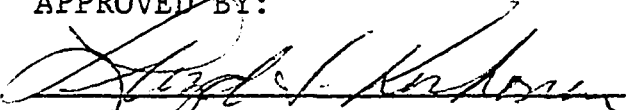
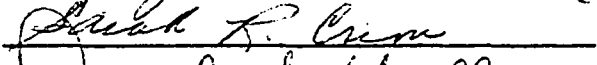
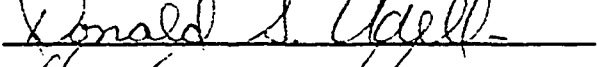
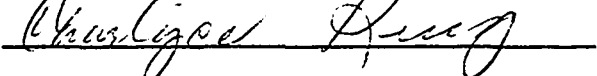
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Norman, Oklahoma

1979

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APPROVED BY:

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ABSTRACT

The study investigated the affect of adult education classes in nutrition on older adults' attitudes and beliefs about nutrition. In addition the study questioned the effect of the level of formal education of older adults on attitudes, beliefs, and knowledge about nutrition.

The sample of 108 older adults included those who had participated in adult education classes in nutrition and those who reported no adult education classes in nutrition. The ages ranged from 55 to 84 years.

A significant positive relationship was found between nutritional knowledge and attitudes toward nutrition and nutritional knowledge and beliefs about nutrition. There was no significant relationship between attitudes and beliefs about nutrition.

Three basic categories of beliefs were significantly related to nutritional knowledge. These beliefs were: the United States population suffers from widespread subclinical deficiencies requiring supplements of vitamins and minerals;

food processing destroys the nutritive value of food; and soil depletion causes malnutrition.

Older adults who had participated in adult education classes in nutrition scored significantly higher on both the attitudes and beliefs tests than the group of older adults who had not enrolled in adult education classes in nutrition. Learning experiences in adult education classes in nutrition increased positive responses to the basic belief that soil depletion causes malnutrition. Three remaining basic beliefs were not significantly different between older adults who had participated in adult education classes in nutrition and older adults who had not participated in nutrition classes.

A significant difference occurred between levels of formal education and nutritional knowledge among these older adults, although the cell mean was higher for older adults with more formal education. Additional research is recommended among older adult education participants and older adults who have not attended adult education programs.

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NUTRITIONAL KNOWLEDGE, ATTITUDES, AND
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A COMPARATIVE STUDY

CHAPTER I

INTRODUCTION

The Older Americans Act of 1965, the first enabling legislation enacted by the Senate and House of Representatives of the United States, provided community funding to assist older persons in obtaining a number of social, economic, and nutritional benefits. The Act created the establishment of the Administration on Aging, and specific programs for the Administration on Aging to administer. One of these programs, designated Title III, provided for community service projects which included nutritional services for the elderly.

It was pointed out at the White House Conference on Food, Nutrition and Health in 1969, that there has been a "lack of public awareness, understanding, and concern that

has permitted the development of limited and fragmented programs" (White House Conference, 1970, p. 171) in community nutrition education which did not successfully solve many of the nutritional problems of older adults.

Programs funded under Title III of the Older Americans Act by grants through the Special Unit on Aging of the Department of Institutions, Social and Rehabilitative Services such as Meals-on-Wheels reach a small part of the population who need them. Originating in 1954 by The Lighthouse in Philadelphia (Lagua, Claudio, and Thiele, 1974), Meals-on-Wheels programs provide delivery of nutritionally balanced meals to the homes of adults age 60 and over. Although information and referrals, escort service, and outreach services are required by Title III, nutrition education is not a part of the program.

The 1969 White House Conference emphasized the need to promote knowledge of food and nutrition. The panel on Community Nutrition Teaching recommended the implementation of "a program to raise levels of public awareness and understanding" (White House Conference, p. 170) of this need to promote knowledge of food and nutrition and involvement of all segments and age groups of the community in nutrition education programs. Robinson (1976) stressed,

"nutrition education is a tool for living needed by about 210 million people in the United States" (p. 126).

The concern for the nutritional problems of the older adult was an important element which brought about the enactment of Public Law 92-258, in 1972, which was designated Title VII of the Older Americans Act of 1965. It authorized a new National Nutrition Program for Older Americans (Nutrition Program for, 1972). The Administration on Aging was designated to administer Title VII through State agencies on aging or another agency designated by the Governor with the approval of the Secretary of Health, Education, and Welfare (House Passes \$250, 1972). Under this legislation, Congregate Meals centers were established for older adults. Congregate Meals is a community based program which was designed to serve one hot meal per day for people age 60 and over. In addition to providing meals, supportive services are required which include nutrition education, outreach activities, transportation and escort services, information and referral, health and welfare counseling, and recreation activities. Congregate Meals programs are also provided for older adults under Title XX. Title XX, unlike Title VII of the Older Americans Act, was designated by the Social Services Amendments of 1974 to the Federal Social Security Act of 1935 by enactment of Public Law

93-647 (Radar, Note 1). This legislation likewise mandated nutrition education services for the Congregate Meals programs.

The combination of balanced meals, nutrition education, and social services should have a positive effect on enabling older adults to continue living in their own homes and prevent needless institutionalization. The rationale for funding Congregate Meals programs was promoting self-care (Radar). Congregate Meals legislation with accompanying nutrition education has been a positive step in meeting part of the needs of older Americans.

The 1970 census reported that there were 20 million people age 65 and older in the United States. The older population increased .7% from the previous decade (1970 Census Shows, 1971). Nearly one-fourth of all older persons lived alone or with non-relatives and one million lived in institutions (Facts About Older, 1976). The percentage of older Americans may increase from .4% to 2.2% by the year 2000 according to the projections of the U. S. Census Bureau (Census Forecasts Population, 1975). The 65 plus age group may increase to 33 million or about 12% of the total population (Rix, 1978).

Many older adults have special needs relating to health and physiological stresses. About 15.7% of adults

over 65 live on a limited food budget (Facts About Older). They need to know how to plan nutritionally balanced meals within their income. Older people are particularly susceptible to "health food" claims (Williams, 1977). They fear that someday they may not be self-sufficient and hope to achieve better health through the claims of "health food" products. Older adults should be able to understand food labels on any food found in the grocery store and make sound judgments, nutritionally and economically.

Each nutrition education program for older adults should be designed to meet the needs of that group. The availability of nutrition education programs for different groups of older adults in the community is another consideration for adult educators. Adult education classes in nutrition offered in community colleges and other community based adult education programs for older adults fulfill a need for nutrition education for other members of the older American population who may not participate in Congregate Meals programs.

Hiemstra (1972) agrees "adult educators must consider the aged as a special clientele with special needs and interests" (p. 108). Latta (1971) affirms programs offered in adult education in community colleges "should

be geared to meet unmet needs of the public" (p. 214).

Korim (1973) states,

As community institutions, community and junior colleges should be concerned with the needs of all population groups, not just the youth. As early as fall 1969, AACJC has been committed to the belief that the needs of the elderly merit greater attention in local programming efforts. (p. 14)

Hendrickson and Barnes (1967) contend "colleges and universities should take seriously their responsibilities to serve the educational needs of older persons along with those in other age groups" (p. 4). Nutrition education has been shown to be one of these needs. Efforts have focused on problems of the older population in the past with increased interest in the past decade.

Background of Theory and Research

A variety of definitions of attitudes are expressed by various authors. A strong similarity exists between most definitions whether simple or complex. A belief "differs from attitude in being relatively free of emotion--it lacks the affective component central to attitude. The cognitive

component or element of knowledge is prominent" (Secord and Backman, 1964, p. 98). Silverman (1975) wrote "a belief may be loosely defined as the acceptance of a statement or proposition as a fact or a truth" (p. 417). It does not necessitate taking action. Munn, Fernald, and Fernald (1969) describe a belief as the "thoughts a person has about the topic in question" (p. 451). Munn, et al. and McDavid and Harari (1969) identify a belief as the cognitive component of an attitude. The other two components are identified as affective values or feelings and predispositions to behavior. Secord et al. state

The term attitude refers to certain regularities of an individual's feelings, thoughts, and predispositions to act toward some aspect of his environment. Feelings are often referred to as the affective component, thoughts as the cognitive component, and predispositions to act as the behavioral component. (p. 97)

Sherif and Sherif (1967) explain further that an attitude is

The individual's set of categories for evaluating a stimulus domain, which he has established as he learns about that

domain in interaction with other persons and which relate him to various subsets within the domain with varying degrees of positive or negative affect. (p. 115)

The behavioral element of an attitude is inferred by a complex combination of internal and external influences. "Attitudes . . . shift over time as a person interacts with the environment" (Knox, 1977, p. 365).

New information which influences attitude changes in the cognitive element may be from various sources (Triandis, 1971). Triandis maintains

Since there is a tendency for consistency among the components of any attitude, changes in the cognitive components will be reflected in changes in the affective component or the behavioral component. (p. 42)

When one component changes, the others will probably change (Triandis).

Sherif and Sherif (1956) developed a social psychological model to demonstrate the frame of reference of observed behavior, which may be verbal or nonverbal. Observed behavior is not a direct result of external stimuli or internal impulses such as motives or desires. According

to Sherif et al. (1956) behavior usually is the "consequence of central psychological structuring or patterning" (p. 78). The frame of reference is determined by interactions of external and internal factors which enter into the process at any particular time. Sherif et al. (1956) state external factors are "objects, cultural products, persons, groups, etc. in the external stimulus situations" (p. 79). Internal factors are "motives, attitudes, emotions, various states of the organism, effects of past experience, etc." (p. 79). The internal and external factors contribute in a combined manner in the perceptual structuring or patterning that takes place. Sherif et al. (1956) explain perceptual structuring as a "prototype of all psychological processes (judging, learning, remembering, imagining, decision making, and so on" (p. 79). At any given moment the interrelated internal and external factors represent an individual's frame of reference which will determine behavior.

Attitudes may be assessed in a variety of ways. Secord et al. report attitudes may be measured by a series of statements concerning the attitude object. The subject is provided with a set of statements or responses, such as agreement or disagreement, from which a choice must be made. Usually techniques utilize an assignment of scale

values for the statements or responses, so that a quantitative index of the attitude may be computed. A second basic method of assessing attitudes is the free-response technique which utilizes open-end questions or interviews. The free-response technique is used when the researcher is more interested in obtaining a "description of the cognitive content of an attitude than a quantitative measure" (p. 106). Both basic methods of assessing attitudes, the attitude scale and the free-response technique, are commonly used.

Schafer and Yetley (1975) presented a model to depict internal and external factors used as a frame of reference of observed food behavior based on the social psychological model developed by Sherif et al. (1956). The model for food behavior suggests food behavior is reflected by selective perception in which nutritional information is evaluated by each individual's unique frame of reference.

According to Schafer et al. "external factors constitute environmental elements, such as friends, other family members, advertisements, television and educational programs, and food" (pp. 129-130). Internal factors were identified as "attitudes toward food, the self-concept, personal values, beliefs, sociogenic, and biogenic needs" (p. 130). Schafer et al. concluded that the use of food,

by food faddists, is a way of establishing stable patterns and coping with social and psychological self-needs. It was suggested nutrition educators should try to change food attitudes of food faddists by recommending other foods rather than by merely presenting nutrition information.

A limited amount of research has been done with older Americans relating to nutritional knowledge and attitudes. No research found by the researcher used a beliefs instrument based on the "four basic food myths, which . . . have been identified by the American Medical Association and the Federal Food and Drug Administration" (Williams, 1977, p. 223). Williams reported that these beliefs are attributed to negative or non-trusting reactions to the progress in agriculture and food technology.

Problem of the Study

The problem for this study was: To examine the effect of adult education classes in nutrition for older adults on their attitudes and beliefs about nutrition compared to a group of older adults who have not enrolled in a nutrition class in adult education.

Purpose of the Study

Since there has been a limited amount of research with older adults relating to nutritional attitudes and

beliefs, the purpose of the research was to explore the following research questions.

I. Does nutrition education for older adults affect their attitudes and beliefs regarding nutrition?

II. Will learning experiences in adult education courses in nutrition affect the individual categories of beliefs held by older adults?

III. Does the level of formal education of older adults affect attitudes, beliefs, and knowledge about nutrition?

Levels of formal education of older adults with less than 12 years of education and of older adults with more than 12 years of education were used to determine if significant differences occur in knowledge, attitudes, and beliefs about nutrition.

The four categories of beliefs represent the four food myths. These categories were used to determine if there were significant differences between these basic beliefs and nutritional knowledge of older adults who have had nutrition classes and older adults who have not had adult education classes in nutrition.

Results of the study will add to the body of research that has been gathered from other age groups and various occupations. The study will contribute information

which may aid those who are responsible for designing adult education programs in nutrition for older adults.

Hypotheses

I. No significant difference exists in attitudes toward nutrition between older adults who have had adult education classes in nutrition from those who have not had these classes.

II. No significant difference exists in beliefs about nutrition between older adults who have had adult education classes in nutrition from those who have not had these classes.

III. No significant difference exists in each of the four basic categories of beliefs between older adults who have had adult education classes in nutrition from those who have not had these classes.

IV. No significant difference exists between levels of formal education and attitudes toward nutrition among older adults who have not had adult education classes in nutrition.

V. No significant difference exists between levels of formal education and beliefs about nutrition among older adults who have not had adult education classes in nutrition.

VI. No significant difference exists between levels of formal education and each of the four basic categories of beliefs among older adults who have not had adult education classes in nutrition.

VII. No significant difference exists between levels of formal education and knowledge of nutrition among older adults who have not had adult education classes in nutrition.

Definitions of Terms

The following definitions are utilized in this research:

Attitudes: "The term attitude refers to certain regularities of an individual's feelings, thoughts, and predispositions to act toward some aspect of his environment" (Secord et al., p. 97).

Beliefs: Cognitive concepts which one believes.

Knowledge of nutrition: Basic knowledge of nourishing the body properly--providing adequately for growth, maintenance, and repair.

Adult education class: Organized learning activities in an adult education program for a specific area involving participants, adult teacher, and sponsoring institution in the community.

Food myths: "Food myths are unproved stories or beliefs about food that are accepted uncritically, or are used to justify one's own desires, interests, or practices" (Williams, p. 222).

Older adults: Adults who are age 55 or over.

Categories of beliefs: Identification of beliefs by their representation of a particular food myth.

Levels of formal education: Having less than 12 years of formal education and having 12 years or more of formal education.

Basic belief: One category or one of the four food myths.

Limitations of the Study

The population of older adults represented a finite group. The criteria established for the study was older adults who have had adult education classes in nutrition and those who have not enrolled in nutrition.

I. The sampling method which involved available samples was used to include older adults who had previously participated in adult education classes in nutrition and those who have enrolled in other adult education courses.

II. A variety of adult nutrition classes contributed to a varied exposure to nutrition for the group of

older adults who had participated in the nutrition classes.

III. The time span difference of enrollment dates in the nutrition classes involved retention of knowledge by the participants.

Description of Sample Attendance

The population consisted of 108 adults, age 55 and over, who had participated in nutrition classes or were currently participating in other adult education classes. The sample was drawn from two adult education programs which are described below.

St. Luke's School of Continuing Education had become internationally known by the eighth year of its current sixteen years of service to adults. Inquiries from all parts of the United States and from Canada and India have stimulated many similar programs (Oklahoma Adult Education, 1970). About seventy classes are offered during the fall and spring semesters. Seventy-two older adults from St. Luke's School of Continuing Education volunteered to participate in the research.

The adult education program at Oscar Rose Junior College has also served as a model for designing similar programs at many community colleges. The Senior Adult Educational Services Program was created for older adults

(Underwood, 1975). Nutrition education is one of over 35 non-credit classes offered. There were 38 older adults who had enrolled in adult education classes in nutrition in past semesters. The names were provided by the Director for Evening Programs and Community Services.

CHAPTER II

REVIEW OF LITERATURE

Interest in the role of nutrition in sustenance of life and maintenance of health has increased since the White House Conference on Food, Nutrition and Health in 1969. Prior to that date and up to the present, research studies in the area of food and nutrition have evolved through the use of many diversified populations. This review of literature is limited to studies relating to knowledge of nutrition, attitudes toward and beliefs about nutrition of various adult groups. Aging will also be discussed.

Beliefs

Most studies found by the researcher on misconceptions of nutrition included some statements directed toward beliefs, as defined in this study, but were assessed along with general misinformation about food and nutrition; therefore such statements were not included in the review. A study on general food beliefs of women (Wilson and Lamb,

1968) showed "that the largest group of participants who accept false beliefs about food were college graduates" (p. 118). The educational level of the sample consisted of 44% college graduates and 24% with 12 years or less education. Fewer incorrect food beliefs were found among persons with a college background in home economics than other academic disciplines. The total sample revealed fewer correct responses among the over 40 age group.

Another study on food beliefs (Jalso, 1964) was designed to distinguish between people who were described as food faddists and non-faddists. Food behavior of the two groups were identified by their use of food supplements, "health foods," special diets, weight control, and avoidance of certain foods. The faddist group had a lower educational level and less formal nutrition education than the non-faddists. The faddists used a greater amount of food supplements and "health foods" than the non-faddist group. Significant correlations were found between opinion scores and age, and opinion scores and formal education, at the .01 level of significance. The sample was made up of men and women from community organizations of different ages, income, and educational levels.

Knowledge and Attitudes

Research began to focus on nutritional attitudes in 1970. Findings indicated nutritional attitudes are an important factor in influencing food practices. Research in earlier years concentrated on nutritional knowledge. The following studies represent varied age groups and occupations. The emphasis has been on the younger adult.

Homemakers and mothers of young children were tested for knowledge of nutrition in several studies during the years 1956 to 1976. Young, Waldner, and Berresford (1956) completed a survey in Rochester and Syracuse pertaining to nutritional knowledge and practices of homemakers. Nutritional knowledge was assessed by the number of food groups the homemaker could identify with a nutritionally correct reason for inclusion in meals they prepared. It was found that the level of education and nutrition knowledge were directly related. The young homemaker had more knowledge of nutrition than the middle-aged homemaker. The old homemaker had the least knowledge about nutrition. Young et al. believed nutritional knowledge was more related to the level of education than age, as the level of education reflected more knowledge of nutrition. The group of homemakers who reported studying foods in school scored higher in knowledge of nutrition than those who did not study foods.

The following study supported the idea nutrition education is important for mothers of young children. Morse, Clayton, and Cosgrove (1967) described a study on knowledge of nutrition compared to the variables, level of education, occupation, and nutritional status of children. The sample was a group of mothers of elementary children. The children were previously assessed in a nutritional status study of volunteer children in Burlington, Vermont. The results of the research indicated mothers with a higher level of education had a better understanding of nutrition. Closer evaluation of those reporting having had a course in nutrition suggested that the course was helpful in attaining a higher score regardless of the level of formal education. Statistics showed that out of a sample of 238 mothers, 81 were high school graduates, 42 were eighth grade graduates, and 21 completed less than eight grades or were unknown. Morse et al. recommended elementary education should include courses in food and nutrition because of the number of secondary education dropouts.

Research on the nutritional knowledge and attitudes of mothers of preschool children in the North Central Region of the United States also found the level of formal education was related to knowledge of nutrition (Eppright, Fox,

Fryer, Lampkin, and Vivian, 1970). Knowledge of nutrition was significantly correlated with attitudes toward nutrition and meal planning and formal education at the .01 level of significance. Eppright et al. encouraged availability of nutrition education for all mothers of preschool children. The data suggested a tendency for improvement in the quality of the children's diet when mothers had more knowledge and certain favorable attitudes toward diets of children.

Emmons and Hayes (1973) thought children should be provided with nutrition education in the school through reading materials which indirectly would reach the family when taken home. The study in two New York school districts investigated the relationship of nutritional knowledge of mothers and their children's diets. The predominant age of the mothers was 25 to 39 years. Data revealed 50% of the group had completed high school. Most of the remaining 50% reported less than 12 years of education. A telephone survey included two questions for the nutrition knowledge test which related to their choice of food for the child's diet. Two similar questions were asked of the children at school. Scoring was based on each food group or food from the group and naming the nutrient or function in the food

group. Mothers and children provided a 24-hour recall of the child's diet over the same day. Reasons for including food groups in the diet were usually expressed as likes and dislikes, and habits or customs, instead of a nutritional basis for inclusion. Mothers selected a better diet for their children than what would be expected from the low nutrition knowledge tests, which indicated a deficiency in the understanding of nutrition principles.

Sims (1976) examined the nutritional knowledge of a sample of university affiliated mothers of preschool children, their attitude toward the importance of nutrition for children, and attitudes toward rearing children. A significant relationship was found between nutritional knowledge and the attitude that nutrition is important for children and with socioeconomic status at the .01 level of significance. Older families and families spending more money for food were found to have less knowledge about nutrition than younger families and families who spent less money. Sims suggested nutrition educators should emphasize improving attitudes toward nutrition to encourage people to improve their diets.

Nutritional attitudes of young adults were assessed when Schwartz (1973) questioned whether high school food

and nutrition classes provided a background for continued interest in adequate diet practices. The study investigated the relationship of current nutrition knowledge, attitudes, and practices of high school graduates who had been enrolled in home economics courses four years previously. Nutritional knowledge was found to be significantly related to nutritional attitudes. A direct relationship was not found between knowledge of nutrition and practices. Schwartz (1973) also compared those who had not taken home economics in high school with those who did take home economics. Those who had classes in home economics obtained higher mean scores on the attitudes and practices tests than the group who had not enrolled in home economics, but there were no significant differences between the two groups. Schwartz (1973) concluded the young adults obtained positive attitudes and nutritional knowledge by other means than high school home economics classes.

The next survey focused on young adults who participated in competitive sports. The increased emphasis on women's sports raises the question of how important women athletes consider nutrition as part of their training program. Werblow, Fox, and Henneman (1978) reported a survey on nutritional knowledge, attitudes, and food patterns of

women athletes at the University of Nebraska. Results of the study indicated women athletes had minimum knowledge about general food misconceptions. The mean score of attitudes toward nutrition was 71 compared to a possible 95. A positive relationship between knowledge and attitudes was reported. Higher knowledge and attitude scores were related to nutrition education. A positive relationship was found between good health and the attitude toward good eating habits. Nutritional knowledge compared to interest in weight control was significant at the .001 level of significance. In comparison, no significant correlation existed between knowledge and general diet or weight control meals. Weblow et al. suggested weight control is an important topic for nutrition education classes for women athletes because of the high interest in weight control reported in the study. The nutritional information may produce a continued interest in food habits in their later adult life. The inclusion of nutrition education was recommended for physical education programs.

The following study points out the need of nutrition education for another group of young adults. Schwartz and Barr (1977) contend "the potential value of prenatal classes as a delivery system for nutrition education must

be recognized" (p. 172). The research on mothers of newborns examined attitudes and practices concerning maternal and infant nutrition. Judgment sampling included only those who met specific criteria. The attitudes test was directed toward nutrition during pregnancy and infancy. The mothers who reported attending prenatal classes had positive attitudes toward maternal and infant nutrition. This relationship was significant at the .001 level of significance. The attitude scores increased as socioeconomic status scores increased. The socioeconomic status scores were derived from the participant's education and occupation of husband. Education of the participants, high school or more, was significantly related to a positive attitude toward maternal and infant nutrition.

In another area of health care, Vickstrom (1972) conducted a survey with registered nurses concerning nutritional knowledge, the nurse's attitude toward nutrition, and how nurses perceive the dietitian's role in patient care. The knowledge instrument was designed to assess the nurse's knowledge of normal and therapeutic nutrition. The attitudes test included attitudes toward nutrition, working in a health care team, modified diets, role in nutrition education of patients, dietitians as professionals, and

nutrition education in nursing school. The age range of the sample was from 21 to 69 years. The mean was 38. A significant relationship was not found between attitudes toward nutrition and knowledge of nutrition. Older and more experienced nurses received higher attitude scores than the younger, lesser experienced nurses. The relationship of nutritional knowledge with the attitude of the nurse toward the role in nutrition education for the patients was reported at the .05 level of significance. As age and experience increased, knowledge of nutrition decreased, suggesting nutrition education should be a part of in-service training for nurses.

A second study used public health nurses as the population. Schwartz (1976) inquired about their nutritional knowledge, attitudes, and practices. The attitudes test involved attitudes toward nutrition and food habits, nutrition counseling, meal planning and preparation. The nutrition practices part of the questionnaire inspected personal dietary practices and professional counseling. A statistically significant and positive relationship was reported between knowledge of nutrition and attitudes toward nutrition, and between knowledge and practices. A positive and significant relationship was also found between

nutritional attitudes and practices of the public health nurses. Nurses who obtained nutrition education from a nutritionist or dietitian in nursing schools scored significantly higher in knowledge on nutrition and practices tests than nurses in programs with a nursing instructor in nutrition. Schwartz (1976) recommended nutrition education for in-service classes for public health nurses.

The nutrition education background of physicians was the topic of inquiry for another study in the field of health. Krause (1973) questioned the physician's likelihood of having the necessary nutritional knowledge to make sound recommendations to patients. Krause sent questionnaires to a self-selected group of physicians. The ages of the physicians ranged from 26 to 82 years. The mean was 48. The knowledge test was over normal and therapeutic nutrition. The attitudes instrument tested attitudes toward nutrition, the physician's role in nutrition education, the profession of dietetics, and nutrition education in medical school. A specific course in nutrition or diet therapy was reported by 9% of the physicians. Some nutrition was integrated in other courses in medical school for 62% compared to 12% who reported none. The knowledge test revealed 65% of the sample answered basic and therapeutic questions

correctly. Basic nutrition received a slightly higher score than therapeutic questions. The findings indicated a positive attitude toward the importance of nutrition education in medical school. The correlations between nutritional knowledge and years in practice, and nutritional knowledge and age were both negative at the .05 level of significance. Most physicians had a positive attitude toward their role in nutrition education. No relationship existed between knowledge and attitudes, or number of years in practice and the physician's attitude toward nutrition. Krause mentioned that nutrition education seminars should be available to physicians.

A different profession, grocery store managers, was selected for research on nutritional knowledge and attitudes "because of the recognition of the retail grocery as one of many occupational groups who influence the nutritional behavior of other persons" (Stansfield and Fox, 1977, p. 68). The sample represented independent grocers and chain store managers. The reported age of 74% of the chain store managers and 28% of the independent grocers was less than 40 years. The average level of education was slightly above 12 years. The means of the knowledge scores were 124 and 123 for independent grocers and chain store

managers as compared to a possible score of 180. Both groups had a mean of 45 for positive attitudes, compared to a possible score of 70. Positive correlations existed between nutrition attitudes and age or education. A significant relationship was found between knowledge of nutrition and education, and between knowledge of nutrition and nutrition attitudes.

Elementary teachers are another group which influences food behavior of others. Peterson and Kies (1972) reported a survey on the influence of nutritional knowledge, attitudes, and nutritional training of teachers as it related to their instruction which may produce desirable food behavior changes in elementary school children. A statistically significant relationship existed between nutritional knowledge and the attitude defined by these researchers as knowledge of the basic four by itself would not insure good eating habits. In contrast, no significant relationship was found between knowledge and the attitude defined as developing a positive attitude toward food is more important in changing eating habits than learning concepts. The knowledge of nutrition scores were low indicating a deficiency in understanding or support in integrating nutrition in the elementary curriculum.

Peterson et al. emphasized traditional methods of teacher preparation for elementary teachers should be revised to become more effective in developing positive attitudes toward teaching nutrition.

Research involving a change of nutritional related behavior was conducted with The Expanded Food and Nutrition Education Program in Missouri (Carruth, Mangel, and Anderson, 1977). A pretest and posttest were given to nutrition education assistants during the training and on the job periods. Carruth et al. combined the variables, knowledge of nutrition, personality traits, attitudes, and food behavior, to ascertain whether flexibility in attitude and personality were correlated with nutritional behavior. The conclusion was the nutrition education assistants with a flexible attitude toward a change in nutritional practices may order nutrition literature for use on the job. An increase in knowledge of nutrition was not statistically significant when compared to ordering the nutrition literature. Scores on the nutrition knowledge posttest increased significantly from the pretest scores. As age increased the nutritional behavior scores decreased.

The following study was the only research found by the researcher on nutritional knowledge and attitudes

which represented the older adult population. The sample consisted of adults over 62 years of age. The average age was 72 years. Purposive sampling was used to collect data about nutritional knowledge, attitudes toward nutrition and diets, and eating habits of elderly adults representing senior citizens' groups (Grotkowski and Sims, 1978). The data were collected by a questionnaire and a three-day food record. The overall nutritional knowledge of the sample was low, with test scores ranging from zero to 16 out of a possible score of 20. The average correct score was 36%. Nutritional knowledge had a positive and significant relationship with the attitude defined as nutrition is important and to socioeconomic status. Socioeconomic status was significantly related to nutrient intakes, but knowledge of nutrition was not related to an adequate diet. No significant relationship was found between nutritional knowledge and the belief that vitamins and mineral supplements were necessary, but a negative relationship existed. The practice of buying food supplements and "health foods" were significantly related to socioeconomic status. Grotkowski recommended nutrition education for the elderly should focus on both nutritional attitudes and knowledge.

Researchers reported studies on nutritional knowledge

and attitudes of many varied groups of adults from 1956 to 1978. Very few studies were found by the researcher which isolated specific beliefs as defined in this study. Grotkowski reported finding a negative relationship between nutritional knowledge and the belief that vitamins and mineral supplements were necessary, but it was not statistically significant.

Epprawright et al., Schwartz (1973, 1976), Werblow et al., Sims, and Stansfield et al. reported significant relationships between knowledge of nutrition and attitudes toward nutrition. Grotkowski stated that the relationship of nutritional knowledge and the attitude defined as nutrition is important was statistically significant.

The level of formal education and nutritional knowledge was reported significantly related by Epprawright et al., Stansfield et al., and Young et al. Vickstrom stated the level of nursing education was significantly related to nutritional knowledge, but nutritional knowledge decreased as age increased. Age was reported significantly related to a positive attitude toward nutrition by Vickstrom and Stansfield et al. Schwartz (1977) and Stansfield et al. reported studies finding the level of education and positive attitudes toward nutrition were significantly related.

Researchers have sampled a variety of populations while investigating the relationship of nutritional knowledge and attitudes of adults. A limited body of research exists on older adults' attitudes toward and beliefs about nutrition.

The Older Adult

An approach to the understanding of older adults is one which considers the changes that take place which are influenced by physiological, psychological, and sociological aspects of aging. Aging is a complex process which results in continual changes in activities and relationships.

Aging is chronological or it can be the result of a decrease in the functioning of bodily systems due to chronic debilitation. The "processes of aging are poorly understood" (Chinn, 1971, p. 179). Two mechanisms which influence aging are genetic factors which regulate the various aging sequence and environmental implications which tend to reduce the individual's life span (Working With Older, 1974).

Knox suggested adults may change in many ways as they become older; and each change event requires adaptability to role relationships to family, friends, retirement,

or community. Knox uses retirement as an example of the social and psychological disengagement process that occurs during the aging years. When this change event occurs, a need for adaption to role relationships results. Retirement may signal less social interactions within the community; consequently the withdrawal from society in turn causes society to withdraw from the aging person. The adult becomes less involved emotionally in the activities and relationships of earlier years. Even though the person is disengaged, a sense of satisfaction and well-being may exist (Neugarten, 1973).

The change event of retirement may be viewed with older adults reacting in different ways. Opposite from the disengagement theory is the activity theory. "The person who ages optimally is the person who stays active and who manages to resist the shrinkage of his social world" (Neugarten, p. 327). According to Neugarten, both theories are based upon observing activity changes of older adults compared to activities of earlier years. Kurtz and Wolk (1975) reported researchers are now questioning the validity of these theories.

Most of the knowledge about aging has been accumulated from cross-sectional studies. These studies have

not discriminated from bias due to cultural, environmental, and social influences (Donahue, 1956). Many differences between young and older adults have been investigated by various researchers and were assumed to be normal with aging.

One of the popular topics for investigation was learning ability of older adults. A study of healthy men ages 65 to 91 by the National Institute of Mental Health attempted to separate aging from disease (Working With Older). The study indicated the men were energetic, outspoken, interesting, and active in everyday living. They demonstrated flexibility and alertness and were resourceful and optimistic. Decreased comprehension, memory, attention, and readiness to respond were more related to disease than to aging. Verbal ability improved with age, opposing the view held by scientists that aging indicates decline in every function.

Another study by the National Institute of Mental Health compared a group of healthy old men to a group of young men (Working With Older). The older group had higher scores on tests of information, comprehension, and verbalization than the group of young men.

As reported by Knox, age has little affect in recall

on adults with high verbal ability. Adults with low verbal ability experience significant declines in recall from young adulthood through older adulthood. Knox suggested that the decline in memory with age may be due to decreased ability to recall or retrieve information because of a lack of organization during the input of the information.

Memory declines noticeably and cognitive functioning decreases with the onset of senility. Aging affects long-term memory and immediate recall differently. Long-term memory is usually not affected by age unless senility is involved. Studies have shown a decline in immediate recall with aging, but researchers question whether there is an impairment in the acquisition or in the retention and retrieval of memory (Kimmel, 1974).

Botwinick (1967) maintained aging does not indicate a progressive loss of memory among healthy adults since many older adults retain a sound memory. Kimmel reported memory and learning ability does not decline prior to age 60 or 65. Motivation, interest, and the lack of recency of an educational experience probably affect the learning process of the older adult. Birren (1964) agreed that learning capacity does not decline with age, instead deficits in perception or attention affect the process of learning.

A lack of response time rather than impaired learning ability is supported by research on serial learning tasks by Eisdorfer (1965). The study on increased stimulus-exposure time versus more response time by the elderly indicated a marked improvement in performance on serial learning when response time was increased. The mean age of the sample was 71.6 years. The data indicated that slower pacing of the stimulus-response time rather than increasing the time to look at the material significantly improved performance. The older adults made fewer errors when given more time for a response. Eisdorfer concluded that rapid pacing contributed to less responses but was not a cause of inability to respond in the time available. The conclusion was older adults could respond rapidly but withheld responses. Subjects were affected by attention focused for the next stimulus and failed to respond to the prior stimulus. Eisdorfer suggested the possibility of stress was another reason why responses were withheld with rapid pacing; therefore, poorer performance of older adults may be due to the increased stress of rapid pacing accompanying the learning task.

Woodruff and Walsh (1975) agreed aging may have little affect on learning ability. "Until recently it was

accepted . . . that learning ability declines with age" (p. 425). Woodruff et al. emphasized that more research is needed to discount completely the relationship of aging to impairment of learning ability.

Adults tend to underestimate their learning ability especially if they have less formal education or if there has been a long period of time in which they have not participated in a formal learning experience (Knowles, 1973). Learning effectiveness is affected by the adult's approach to the learning activity. The approach to learning reflects personal characteristics such as self-directedness and recency of educational experience (Knowles).

Older adults learn most effectively when they set their own pace, when they take a break periodically, and when the distribution of learning activities is fitted to the content of the course. These conditions give older adults feelings of security if they are apprehensive about their ability to learn. An understanding of adult development and learning is important when planning learning activities for older adult education programs.

CHAPTER III

METHODOLOGY

The study investigated the nutritional knowledge, attitudes, and beliefs of older adults. An instrument was developed, tested, and the results reported. The procedure is presented below.

Selection of the Sample

The population consisted of adults, age 55 and over, who had participated in nutrition classes or were currently participating in a different kind of adult education class. The sample included older adults who had participated or were currently participating in an adult education program at Oscar Rose Junior College and St. Luke's School of Continuing Education. The criteria for purposive sampling were older adults who have had adult education classes in nutrition and those who have not enrolled in nutrition.

Research Instrument

The instrument was designed to include tests of knowledge, attitudes, and beliefs about nutrition, and certain demographic data.

The nutrition test, designed for a diversity of adults, consists of 25 multiple-choice questions over basic nutrition concepts. The test was developed and validated by Prefontaine (1975). A test for internal consistency resulted in a coefficient of reliability of .81, indicating "the test items represent a relatively homogenous universe of nutrition" (p. 53). The nutrition test was scored by using a weight of three for each correct answer. The total score for the test was 75.

The attitudes test was developed and validated by Eppright in 1965 (Note 2). Schwartz revised this test for a later study (1973). The test consists of 11 statements reflecting attitudes toward nutrition. The attitudes test was scored by using the scoring system developed by Schwartz (1973). Each statement requires a choice of agreement or disagreement with four degrees of certainty. A correct answer with a high degree of certainty was seven points and an incorrect answer with a high degree of certainty was given zero. Correct answers with degrees of certainty

ranged from seven to four and incorrect answers with degrees of certainty ranged from zero to three. The total score with a high degree of certainty was 77.

The beliefs test, designed by the investigator, reflects the four basic food beliefs identified by the American Medical Association and the Federal Food and Drug Administration. The test contains 12 statements. Three statements represent each of the four basic food beliefs. These beliefs are:

All disease is the result of faulty
diet Soil depletion causes mal-
nutrition The United States
population suffers from widespread sub-
clinical deficiencies requiring supple-
ments of vitamins and minerals
Food processing destroys the nutritive value
of food. (Williams, pp. 223-225)

A jury panel of nutritionists was used to validate the instrument. The criterion for each test statement was that the statement should reflect a basic belief. The jury panel evaluated and agreed the statements reflected the four basic food beliefs. The beliefs test was scored by using a weight of six for each correct answer. The total score for the beliefs test was 72.

Data Analysis

The independent variables for the data analysis were:

I. A group of older adults who have had adult education classes in nutrition.

II. A group of older adults who have not had adult education classes in nutrition.

III. Older adults who have had less than 12 years of formal education.

IV. Older adults who have had 12 or more years of formal education.

The dependent variables were:

I. Knowledge test scores of both groups of older adults.

II. Attitudes test scores of both groups of older adults.

III. Beliefs test scores of both groups of older adults.

IV. Scores for the four categories of basic beliefs of both groups of older adults.

The completed instruments were coded and the total sample analyzed. Frequency distributions were tabulated for the demographic data. Data cards were key punched

and computer analysis utilized for the following procedures.

The evaluation for hypotheses one and two was tested by using two-way analyses of variance. Raw scores for attitudes and beliefs tests of those who have had adult education classes in nutrition and those who have not had classes in nutrition were compared.

The evaluation for hypothesis three was completed by using two-way analysis of variance. The four categories of basic beliefs were compared between older adults who have had classes in nutrition and those who have not had classes in nutrition.

The evaluation for hypotheses four and five was performed by two-way analyses of variance. Raw scores for attitudes and beliefs tests of older adults who have not had adult education classes in nutrition were compared between those who have had 12 years or more of formal education and those who have had less than 12 years of formal education.

The evaluation for hypothesis six was tested by two-way analysis of variance. The four categories of basic beliefs about nutrition of older adults who have not had adult education classes in nutrition were compared between

those who have had 12 years or more of formal education and those who have had less than 12 years of formal education.

The evaluation for hypothesis seven was tested by two-way analysis of variance. Knowledge of nutrition raw scores of older adults who have not had adult education classes in nutrition were compared between those who have had 12 years or more of formal education and those who have had less than 12 years of formal education.

CHAPTER IV

DISCUSSION OF FINDINGS

This study was conducted to investigate the effect of adult education classes in nutrition for older adults on their attitudes and beliefs about nutrition. The 108 subjects included older adults who had participated or were currently participating in adult education programs at Oscar Rose Junior College and St. Luke's School of Continuing Education.

The data were obtained by an instrument which included tests of knowledge, attitudes, and beliefs about nutrition, and certain demographic data. The instrument was administered to 38 subjects who had participated in senior adult classes in nutrition at Oscar Rose Junior College. The names were provided by the Director for Evening Programs and Community Services at Oscar Rose Junior College. Seventy-two older adults attending the noon program at St. Luke's School of Continuing Education volunteered to fill out the instrument. This group consisted

of 14 older adults who had participated in adult education classes in nutrition and 56 who had not enrolled in nutrition. There were two incomplete instruments in this group.

Ages ranged from 55 to 84 years in both groups of adults. Two older adults reported ages simply as retired, one reported 60 plus, and one reported 65 plus. The mean age reported was 67.16. The largest percentage who had had adult education classes in nutrition was in the 55 to 60 age group. No males reported enrollment in adult education classes in nutrition. There were 11 males in the group who did not have adult education classes in nutrition (Table 1, p. 48).

The sample consisted of 25 older adults who reported less than 12 years of formal education and 83 who reported 12 years or more of formal education. The data indicated 77% of the sample reported 12 years or more of formal education. Table two (p. 49) shows the percentage of formal education for the two groups of older adults.

Pearson Product-Moment correlation coefficients were computed using SAS on the test scores of the sample (Table 3, p. 50) to measure the degree and direction of relationships between the variables. Test statements on individual beliefs were summed for categories of beliefs scores.

Table 1
Frequency and Percentage of Sample Age

Sample	Age	Number	Percentage
Adult Education Classes in Nutrition	55-60	18	.35
	61-65	10	.19
	66-70	12	.23
	71-75	6	.12
	76-80	4	.08
	81-85	1	.02
Total		51	1.00
No Adult Education Classes in Nutrition	55-60	11	.21
	61-65	3	.06
	66-70	15	.28
	71-75	14	.26
	76-80	7	.13
	81-85	3	.06
Total		53	1.00

Note: Two reported ages as retired, one reported 60 plus, and one reported 65 plus.

Table 2
Frequency and Percentage of Levels
of Formal Education
for the Sample

Sample	Levels of Education	Number	Percentage
Adult Education Classes in Nutrition	12 years or more	37	.71
	Less than 12 years	15	.29
Total			1.00
No Adult Educa- tion Classes in Nutrition	12 years or more	46	.82
	Less than 12 years	10	.18
Total			1.00

Table 3
Pearson Product-Moment Correlation
Coefficients Between Test Scores
of 108 Older Adults

Tests	1	2
1. Nutrition	1.00	.37
2. Attitudes	.37	1.00
3. Beliefs	.25	.02
4. All disease is the result of faulty diet	-.04	-.14
5. Soil depletion causes malnutrition	.21	.01
6. Widespread subclinical deficiencies require supplements of vita- mins and minerals	.29	.19
7. Food processing destroys the nutri- tive value of food	.22	.06

Note: Tests 4, 5, 6, and 7 are the four categories of
beliefs about nutrition.
 $r = .187$ at the .05 level of significance.

A significant coefficient ($r = +.37$) between attitudes toward nutrition and nutritional knowledge was significant at the .05 level of significance. The relationship between beliefs about nutrition and knowledge of nutrition ($r = +.25$) was significant at the .05 level of significance, but no significant relationship occurred between beliefs about nutrition and attitudes toward nutrition.

There were three categories of beliefs about nutrition which were significantly related to knowledge of nutrition. The relationship between the belief that the United States population suffers from widespread subclinical deficiencies requiring supplements of vitamins and minerals and knowledge of nutrition ($r = +.29$) was found at the .05 level of significance. The correlational coefficients between the belief that soil depletion causes malnutrition and nutritional knowledge ($r = +.21$) and the belief that food processing destroys the nutritive value of food and nutritional knowledge ($r = +.22$) were both significant at the .05 level of significance.

A relationship ($r = +.19$) between attitudes toward nutrition and the belief that the United States population suffers from widespread subclinical deficiencies requiring

supplements of vitamins and minerals was found at the .05 level of significance. A negative relationship ($r = -.14$) existed between attitudes and the belief that all disease is the result of a faulty diet but it was not significant. A second negative relationship ($r = -.04$) between this belief and nutritional knowledge was not significant.

Testing the Hypotheses

Two-way analyses of variance were used to test the hypotheses. These analyses were used because data from two independent groups of older adults were compared to determine if the means of the groups differed significantly as a result of only one of the groups having had the experience of adult education classes in nutrition. The measure utilizes an assumption of a normal population distribution of older adults and an assumption that the variances of the groups are the same.

The Biomedical Computer Program P2V was selected for the computations because it performs analysis of variance for unequal cell sizes and can utilize grouping factors.

Hypotheses One and Two

Two-way analyses of variance were computed for hypotheses one and two.

I. No significant difference exists in attitudes toward nutrition between older adults who have had adult education classes in nutrition from those who have not had these classes.

II. No significant difference exists in beliefs about nutrition between older adults who have had adult education classes in nutrition from those who have not had these classes.

A significant difference was found in attitudes toward nutrition between the group of older adults who had had adult education classes in nutrition and the group who had not enrolled in nutrition at the .05 level of significance. This result indicated an effect on the attitudes of one of the groups. The data for the cell means of the two groups on attitudes toward nutrition indicated that the group of older adults who had participated in adult education classes in nutrition had a higher cell mean on the attitudes test than the group of older adults who did not have nutrition classes. The researcher concluded that adult education classes in nutrition had an effect on older adults' attitudes toward nutrition. Tables four and five (pp. 54 and 55) illustrate the obtained data.

Table 4
Two-Way Analysis of Variance Comparing Attitudes
and Beliefs for the Two Groups of Older Adults

	Degrees of Freedom	Mean Square	F	P
Attitudes	1	396.584	6.21	0.014
Error	106	63.832		
Beliefs	1	861.897	4.23	0.042
Error	106	203.630		
Note: F = 3.93 at the .05 level of significance. N = 108				

Table 5

Cell Means and Standard Deviations on Attitudes and
Beliefs for the Two Groups of Older Adults

	Cell Means	Standard Deviations
Had Adult Education Classes in Nutrition		
Attitudes	70.942	7.445
Beliefs	46.154	16.097
No Adult Education Classes in Nutrition		
Attitudes	67.107	8.463
Beliefs	40.500	12.336
Note: N = 108		

The beliefs test between the two groups of older adults was significantly different at the .05 level of significance. An F-value of 4.23 existed compared to 3.93 which was needed for the .05 level of significance (Table 4, p. 54). The group of older adults who had enrolled in adult education classes in nutrition obtained a cell mean of 46.154 on the beliefs test compared to a cell mean of 40.500 for the group of older adults who did not have this experience (Table 5, p. 55). The significant difference obtained by the test results on beliefs about nutrition between the two groups of older adults showed that adult education classes in nutrition had an effect on the beliefs about nutrition held by older adults.

Hypothesis Three

Two-way analysis of variance was used to test hypothesis three.

III. No significant difference exists in each of the four basic categories of beliefs about nutrition between older adults who had had adult education classes in nutrition from those who have not had these classes.

A significant difference occurred between the two groups of older adults in acceptance of the basic belief that soil depletion causes malnutrition at the .05 level

of significance (Table 6, p. 58). The group of older adults who had had adult education classes in nutrition had a cell mean of 8.654 for the basic belief (Table 7, p. 59). The cell mean of 4.393 was found for the basic belief for the group of older adults who had not enrolled in these classes. Since the group of older adults who had participated in adult education classes in nutrition scored higher on the basic belief statements than the group of older adults who had not enrolled in nutrition the researcher concluded that adult education classes in nutrition had some effect of rejection of the belief that soil depletion causes malnutrition. Acceptance of the three remaining basic beliefs were not significantly different between the two groups of older adults (Table 6, p. 58).

Both groups scored high on the basic belief that the United States population suffers from widespread sub-clinical deficiencies requiring supplements of vitamins and minerals. The possible score on the statements for a basic belief was 18. The cell mean for the group of older adults who had had adult education classes in nutrition was 16.846 compared to a cell mean of 15.750 for the group of older adults who had not enrolled in these classes (Table 7, p. 59).

Table 6

Two-Way Analysis of Variance Comparing Basic Beliefs
Between the Two Groups of Older Adults

Basic Beliefs	Degrees of Freedom	Mean Square	F	P
All disease is the result of faulty diet	1	30.478	0.87	0.352
Error	106	34.920		
Soil depletion causes malnutrition	1	489.540	16.42	0.000
Error	106	29.822		
Widespread subclinical deficiencies require supplements of vitamins and minerals	1	32.397	2.87	0.093
Error	106	11.276		
Food processing destroys the nutritive value of food	1	86.244	2.21	0.140
Error	106	38.994		

Note: F = 3.93 at the .05 level of significance.
N = 108

Table 7
Cell Means for Tests on Basic Beliefs Between
the Two Groups of Older Adults

	Cell Means ¹	Cell Means ²
All disease is the result of faulty diet	9.115	10.178
Soil depletion causes malnutrition	8.654	4.393
Widespread subclinical deficiencies require supplements of vita- mins and minerals	16.846	15.750
Food processing destroys the nutritive value of food	11.538	9.750

Note: N = 108

(1) The group of older adults who had had adult
education classes in nutrition.

(2) The group of older adults who had not enrolled
in nutrition classes.

Hypotheses Four and Five

Two-way analyses of variance were computed for hypotheses four and five.

IV. No significant difference exists between levels of formal education and attitudes toward nutrition among older adults who have not had adult education classes in nutrition.

V. No significant difference exists between levels of formal education and beliefs about nutrition among older adults who have not had adult education classes in nutrition.

The results of the data indicated that no significant difference existed between older adults who had more than 12 years of formal education and older adults who had less than 12 years of formal education on the nutrition attitudes test (Table 8, p. 61). The analysis was computed on older adults who were in adult education classes but had not enrolled in adult education classes in nutrition. The cell means for attitudes toward nutrition for older adults who had completed 12 years or more of formal education was 67.783 compared to a cell means of 64.000 for the group of older adults who had less than 12 years of formal education (Table 9, p. 62). The possible score for the attitudes test was 77.

Table 8
 Analysis of Variance Between Levels of Education
 on Attitudes and Beliefs of 56 Older Adults

	Degrees of Freedom	Mean Square	F	P
Attitudes	1	117.531	1.66	0.203
Error	54	70.774		
Beliefs	1	579.600	4.02	0.050
Error	54	114.267		

Note: F = 4.02 at the .05 level of significance. The older adults had not enrolled in adult education classes in nutrition.

Table 9
Cell Means and Standard Deviations for Tests on
Attitudes and Beliefs for Levels of Education
for 56 Older Adults

	Cell Means	Standard Deviations
12 Years or More of Formal Education		
Attitudes	67.783	8.116
Beliefs	42.000	12.394
Less than 12 Years of Formal Education		
Attitudes	64.000	9.764
Beliefs	33.600	9.879
Note: The older adults had not enrolled in adult educa- tion classes in nutrition.		

The beliefs about nutrition test was significantly different between the levels of formal education for older adults who had not enrolled in adult education classes in nutrition at the .05 level of significance (Table 8, p. 61). The older adults who had completed 12 or more years of formal education obtained a cell mean of 42.000 on the beliefs about nutrition test. A cell mean of 33.600 represented the older adults who had less than 12 years of formal education (Table 9, p. 62). A score of 72 was possible on the beliefs about nutrition test. The higher cell mean for the group with more than 12 years of formal education identified the group of older adults who held more positive beliefs about nutrition. The researcher concluded that older adults who had not enrolled in adult education classes in nutrition but had more formal education rejected more false beliefs about nutrition than older adults who had not had nutrition classes and had less formal education.

Hypothesis Six

Two-way analysis of variance was used to test hypothesis six.

VI. No significant difference exists between levels of formal education and each of the four basic

categories of beliefs among older adults who have not had classes in nutrition.

No significant difference was found between levels of formal education and each one of the four basic beliefs about nutrition (Table 10, p. 65). A correct score of 18 was possible for each basic belief. The belief that the United States population suffers from widespread subclinical deficiencies requiring supplements of vitamins and minerals received the highest cell mean for both levels of formal education (Table 11, p. 66). The older adults who had completed 12 years or more of formal education and the older adults who had less than 12 years of education scored lower on the belief that soil depletion causes malnutrition than the other three basic beliefs about nutrition. According to the data, the level of formal education of older adults did not have a significant effect on the basic beliefs held by older adults who had not enrolled in adult education classes in nutrition. A difference in the magnitude of acceptance between the four basic beliefs was noted.

Hypothesis Seven

Two-way analysis of variance was computed for hypothesis seven.

Table 10

Analysis of Variance Comparing Levels of Formal Education
with Basic Beliefs for Older Adults Who Have Not
Had Adult Education Classes in Nutrition

Basic Beliefs	Degrees of Freedom	Mean Square	F	P
All disease is the result of faulty diet	1	108.006	3.19	0.080
Error	54	33.893		
Soil depletion causes malnutrition	1	48.348	2.16	0.148
Error	54	22.426		
Widespread subclinical deficiencies require supplements of vitamins and minerals	1	13.422	0.88	0.351
Error	54	15.168		
Food processing destroys the nutritive value of food	1	79.161	2.24	0.140
Error	54	35.284		

Note: F = 4.02 at the .05 level of significance.
N = 56

Table 11
Cell Means Comparing Levels of Formal
Education on Basic Beliefs
for 56 Older Adults

	Cell Means ¹	Cell Means ²
All disease is the result of faulty diet	10.826	7.200
Soil depletion causes malnutrition	2.400	4.826
Widespread subclinical deficiencies require supplements of vita- mins and minerals	15.522	16.800
Food processing destroys the nutritive value of food	10.304	7.200

Note: The older adults had not enrolled in adult education classes in nutrition.

(1) 12 years or more of formal education.

(2) Less than 12 years of formal education.

VII. No significant difference exists between levels of formal education and knowledge of nutrition among older adults who have not had adult education classes in nutrition.

The results for the data indicated that no significant difference occurred between 12 or more years of formal education and less than 12 years of formal education for nutritional knowledge of older adults who had not enrolled in adult education classes in nutrition (Table 12, p. 68). The correct score for the knowledge of nutrition test was 75. Older adults who had 12 years or more of education received a cell mean of 51.000 compared to a cell mean of 45.600 for the older adults who had completed less than 12 years of formal education. Table 13 (p. 68) illustrates the obtained data.

Table 12

Analysis of Variance on Levels of Formal
Education and Nutritional Knowledge
for 56 Older Adults

	Degrees of Freedom	Mean Square	F	P
Nutrition	1	239.529	1.65	0.204
Error	54	144.933		

Note: $F = 4.02$ at the .05 level of significance. The older adults had not enrolled in adult education classes in nutrition.

Table 13

Cell Means and Standard Deviations for Tests on
Nutritional Knowledge Compared to Levels
of Education for 56 Older Adults

	Cell Means	Standard Deviations
12 Years or More of Formal Education		
Nutrition	51.000	11.261
Less than 12 Years of Formal Education	45.600	15.350

Note: The older adults had not enrolled in adult education classes in nutrition.

CHAPTER V

DISCUSSION AND SUMMARY

This study investigated three research questions. Does nutrition education for older adults affect attitudes and beliefs regarding nutrition? A second question asked if learning experiences in adult education classes in nutrition affects the individual categories of beliefs held by older adults. A third questioned if the level of formal education of older adults affects their attitudes, beliefs, and knowledge about nutrition.

The sample of 108 older adults included those who had had adult education classes in nutrition and those who reported no adult education classes in nutrition. The instrument contained a nutritional knowledge test, attitude test, beliefs test, and demographic section. There were 77% of older adults who had completed 12 or more years of formal education. Less than 12 years of formal education were reported by 29% of older adults who had had adult education classes in nutrition and 18% of the group who did

not have nutrition classes. Ages for the sample of older adults ranged from 55 to 84 years.

Pearson Product-Moment correlations were computed to find relationships between nutritional knowledge, attitudes toward nutrition, and beliefs about nutrition. A significant relationship was found between nutritional knowledge and attitudes and nutritional knowledge and beliefs at the .05 level of significance. There was no significant relationship between attitudes toward nutrition and beliefs about nutrition. Three basic beliefs were related to nutritional knowledge at the .05 level of significance. These beliefs were: the United States population suffers from widespread subclinical deficiencies requiring supplements of vitamins and minerals; food processing destroys the nutritive value of food; and soil depletion causes malnutrition. The only basic belief that was significantly related to attitudes at the .05 level of significance was the belief that the United States population suffers from widespread subclinical deficiencies requiring supplements of vitamins and minerals.

Two-way analyses of variance were computed to test the hypotheses for the research. Attitudes toward nutrition and beliefs about nutrition were both found to have a

significant difference between the group of older adults who had had adult education classes in nutrition and older adults who had not enrolled in such classes at the .05 level of significance. The older adults who had had adult education classes in nutrition scored significantly higher on both the attitudes and beliefs tests than the group who did not enroll in nutrition. One of the four basic beliefs was significantly different between the two groups of older adults. This belief that soil depletion causes malnutrition existed at the .05 level of significance. The group of older adults who had had experiences in adult education classes in nutrition obtained a higher cell mean on this belief than the older adults who did not have adult education classes in nutrition. The remaining three basic beliefs were not significantly different between older adults who had participated in adult education classes in nutrition and older adults who had not reported such classes.

Older adults who had not enrolled in adult education classes in nutrition were tested on levels of formal education for attitudes toward nutrition, beliefs about nutrition, basic beliefs, and nutritional knowledge. Results of the attitudes test were not significantly different between older adults who had completed 12 or more

years of formal education and older adults who reported less than 12 years of education. A significant difference between levels of education for older adults in their beliefs about nutrition was found at the .05 level of significance. Older adults who reported 12 years or more of education obtained a higher cell mean on the beliefs test than those with less than 12 years of education. None of the basic beliefs proved to be significantly different between adults who had 12 or more years of formal education and those who completed less than 12 years of education. No significant difference occurred between levels of education among older adults who had not enrolled in adult education classes in nutrition; although the cell mean for older adults who completed 12 years or more was higher than the cell mean for the older adults who reported less than 12 years of education.

Conclusions

This study supports research reported by Eppright et al., Schwartz (1973, 1976), Werblow et al., Sims, and Stansfield et al. that a significant relationship exists between knowledge of nutrition and attitudes toward nutrition. A significant relationship was found between nutritional knowledge and attitudes and nutritional knowledge

and beliefs at the .05 level of significance. The results of this study indicated that adult education classes in nutrition had a positive effect on attitudes and beliefs about nutrition for older adults who participated in such classes. The effect of adult education classes in nutrition was shown by older adult participants by some increase in rejection of false beliefs about nutrition. Learning experiences in adult education classes in nutrition did not affect each one of the four basic categories of beliefs but did increase a positive response to the belief that soil depletion causes malnutrition. The remaining three basic beliefs were not significantly rejected by older adults regardless of whether they had adult education classes in nutrition or did not have such classes.

The data indicated that the level of formal education did not significantly affect attitudes toward nutrition for older adults who did not have adult education classes in nutrition. A higher level of education increased the beliefs about nutrition scores significantly resulting in a positive effect on the beliefs held by older adults who had not enrolled in adult education classes in nutrition. Categories of basic beliefs were not affected by the level of education for older adults who reported no adult

education classes in nutrition. The level of formal education did not significantly affect the nutritional knowledge of older adults who had not enrolled in adult education classes in nutrition; although those with more formal education obtained a higher cell mean on the nutrition test.

Recommendations

Additional research is recommended among older adult education participants and older adults who have not attended adult education programs. Another possible area of research with older adults might be conducted with participants in the mandatory nutrition education programs provided by Congregate Meals centers to determine if these nutrition education programs throughout a given state affect nutritional knowledge, attitudes, and beliefs about nutrition. Such a study might also be beneficial in evaluating to some extent the success of these nutrition education programs. A survey is recommended of the current eating habits of these older adults to ascertain if changes occur as a result of nutrition education.

This author's research disclosed that men were not enrolling in the adult education classes in nutrition which suggests a study might be informative if designed to

investigate why older men do not express interest by enrolling in available classes in nutrition. Findings indicated that the nutritional knowledge level of the population could be enhanced through continuing education programs.

A study is recommended to determine why the category of basic beliefs on supplements of vitamins and minerals as reported by this author did not change with nutrition education or formal education. The findings of this study suggested that this belief may not be a myth among older adults. Further studies might provide additional information relating to this belief among the older segment of the population. This research identified a need for additional accurate nutritional knowledge addressed toward the other basic beliefs about nutrition.

Few studies have been reported which investigated age levels at which nutritional beliefs are established. This author recommends various age level groups be investigated and the data be analyzed comparatively by age level. Research designed to determine accurately when beliefs about nutrition are established would appear to be a productive area of research.

While community health programs were beyond the scope of this study, it would appear that the nutritional

components of community health programs may be an area worthy of study to determine the affect of nutrition education on the target group. This study did not address such influences as socio-economic levels, cultural influences, and personality traits as related to nutrition. Further studies might determine if these characteristics have possible effects on older adults' attitudes and beliefs about nutrition.

Studies conducted to determine the methods and sources of nutritional information which influence the nutritional attitudes and beliefs of various age groups are suggested. Longitudinal studies should be continued to ascertain if the present younger generation upon reaching adulthood have similar attitudes and beliefs about nutrition as found in this study.

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APPENDIX A

THE UNIVERSITY OF BRITISH COLUMBIA
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DIVISION OF HUMAN NUTRITION
SCHOOL OF HOME ECONOMICS

28th. June, 1978.

Ms. Dorothy M. Olson,
Nutrition Department,
University of Oklahoma,
Norman, Oklahoma,
U. S. A.

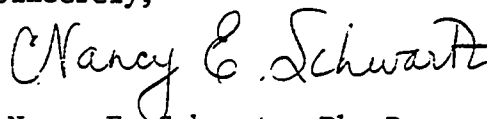
Dear Ms. Olson:

In response to your request, I am pleased to provide you with permission to utilize the nutrition attitude test instrument which was developed for my research at the Ohio State University in 1973.

I would appreciate receiving further information about your research plans as well as a copy of your findings.

Please let me know if I may be of assistance.

Sincerely,



Nancy E. Schwartz, Ph. D.,
Assistant Professor.

NES/mm

Marielle Préfontaine
Ecole Des Sciences Domestiques
Université De Moncton
Moncton, M. B., Canada

Dear Dr. Préfontaine:

I received the copy of the Nutrition Questionnaire which you sent to me. I would like permission to use it as a part of the questionnaire for my dissertation. If possible, I would also like to have a key to the test.

I am a graduate student in higher education at the University of Oklahoma.

I would appreciate this very much.

Sincerely yours,

Dorothy M. Olson
Dorothy M. Olson
1320 Barbour St.
Norman, Oklahoma 73069

*You can use it for
your dissertation
Thank you*

APPENDIX B

JURY PANEL

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BASIC BELIEFS AND TEST STATEMENTS

The numbered statements are the four basic food beliefs which have been identified by the American Medical Association and the Federal Food and Drug Administration. The test statements below each belief reflect that belief.

1. All disease is the result of faulty diet.
 - a. Most disease can be prevented by a good diet.
 - b. The average American can prevent colds by taking vitamin C.
 - c. Poor health is usually the result of inadequate nutrition.
2. Soil depletion causes malnutrition.
 - a. Food grown on depleted soil has low nutritional value.
 - b. Vegetables grown on poor soil have as many vitamins as vegetables grown on rich soil.
 - c. Food grown organically has more nutritional value than food grown with chemical fertilizers.
3. The United States population suffers from widespread subclinical deficiencies requiring supplements of vitamins and minerals.
 - a. It is possible to obtain all the vitamins and minerals needed by eating a variety of food.
 - b. Taking large doses of certain vitamins may be harmful.
 - c. The greater the number of vitamins and/or minerals a capsule contains the better it is for you.
4. Food processing destroys the nutritive value of food.
 - a. Most of the vitamins and minerals are not destroyed by commercial canning.
 - b. The nutritive value of processed food is always reduced.
 - c. Frozen orange juice is much less nutritious than fresh orange juice.

APPENDIX C

NUTRITION OPINIONS

Some statements concerning nutrition and eating habits are made below. We are interested in your judgment of each statement, in terms of how it reflects your personal opinion or feelings. If the statement describes how you feel, circle 'A' for agree; if the statement does not describe how you feel, circle 'D' for disagree. After you have made your decision, indicate how certain you are about the decision:

- Circle 1. If you are very confident about your decision
(A or D)
2. if you are moderately confident about your decision
3. if you are moderately doubtful about your decision
4. if you are very doubtful about your decision

Please be sure to respond twice to each statement.

Sample: Nutrition is important to good health. This opinion is agreement, with moderate confidence, that nutrition is important to good health.

(A) 1 (2) 3 4
D

	<u>Agree or Disagree</u>	<u>Degree of Certainty</u>
	A D	1 2 3 4
1. Since nutrition is important, I should not be careless about selection of foods.	A D	
2. Foods have so many vitamins added now that I don't have to bother about nutrition.	A D	1 2 3 4
3. As long as I am not sick, I guess I must be eating right.	A D	1 2 3 4
4. Even if I take vitamins, I feel that I should be concerned about my diet.	A D	1 2 3 4

- | | | | | | | |
|-----|---|--------|---|---|---|---|
| 5. | I feel if I drink enough milk, I won't have nutritional problems. | A
D | 1 | 2 | 3 | 4 |
| 6. | As long as the doctor doesn't say anything about nutrition, I don't think I need to be concerned. | A
D | 1 | 2 | 3 | 4 |
| 7. | I just don't have time to think much about nutrition. | A
D | 1 | 2 | 3 | 4 |
| 8. | Nutrition is not so important as long as I eat a lot. | A
D | 1 | 2 | 3 | 4 |
| 9. | I am concerned about getting my family and friends to eat foods that are good for them. | A
D | 1 | 2 | 3 | 4 |
| 10. | Children should be allowed to eat whatever they want. | A
D | 1 | 2 | 3 | 4 |
| 11. | Nutrition is not so important if I have plenty of liquids. | A
D | 1 | 2 | 3 | 4 |

NUTRITION BELIEFS

Some statements concerning nutrition are given below. Indicate whether or not you believe the statement is true or false. Circle "T" for true and "F" for false.

Sample: Gelatin is a poor source of high quality protein.

(T) F

- | | | | |
|----|--|---|---|
| 1. | Most diseases can be prevented by a good diet. | T | F |
| 2. | Food grown organically has more nutritional value than food grown with chemical fertilizers. | T | F |
| 3. | Taking large doses of certain vitamins may be harmful. | T | F |
| 4. | Most of the vitamins and minerals are not destroyed by commercial canning. | T | F |

- | | | |
|---|---|---|
| 5. Vegetables grown on poor soil have as many vitamins as vegetables grown on rich soil. | T | F |
| 6. The nutritive value of processed food is always reduced. | T | F |
| 7. It is possible to obtain all the vitamins and minerals needed by eating a variety of food. | T | F |
| 8. The average American can prevent colds by taking vitamin C. | T | F |
| 9. Frozen orange juice is much less nutritious than fresh orange juice. | T | F |
| 10. The greater the number of vitamins and/or minerals a capsule contains the better it is for you. | T | F |
| 11. Poor health is usually the result of inadequate nutrition. | T | F |
| 12. Food grown on depleted soil has low nutritional value. | T | F |

NUTRITION KNOWLEDGE

Some statements or questions concerning nutrition are made below. Indicate the answer which you think is correct by circling the number preceding it.

-
- Sample: 1. Cellulose is important in the diet because it
- 1. contains minerals
 - 2. has a satiety value
 - ③. acts as a "regulatory" substance
 - 4. provides energy
-

1. The best way to be sure one is properly fed is
- 1. to try recipes published in magazines and newspapers
 - 2. to take one's own family eating habits as a model
 - 3. to follow one's own instinct
 - 4. to follow the recommendations given in the Food guide

2. Cream soups, dishes containing grilled cheese and milk desserts
 1. are good sources of vitamin C
 2. have the same nutritive value as milk
 3. are less nutritious than milk
 4. are good sources of iron
3. It is recommended to eat meat, fish or one of their substitutes
 1. every day
 2. three times a week
 3. rarely
 4. occasionally
4. Which of the following two foods contain the same number of calories?
 1. a piece of cake and an apple
 2. a potato and a tomato
 3. a glass of whole milk and a glass of skim milk
 4. a pat of butter and a pat of margarine (square)
5. It is recommended to take vitamin D from extracts of cod liver oil or from other forms of supplements because
 1. vitamin D prevents anemia
 2. vitamin D protects against infection
 3. foods are low in vitamin D
 4. more vitamin D is needed during increased energy expenditure
6. Among the following groups of food, which contain many calories but few vitamins and minerals are
 1. hamburgers and hot dogs
 2. candies and pastries
 3. potatoes and beets
 4. meat pies and pastas
7. A well balanced food intake is one which
 1. allows a person to maintain a desirable weight
 2. contains sufficient amounts of proteins, sugars and fats
 3. contains the nutrients needed by the body
 4. includes three meals a day, taken at regular intervals

8. A good breakfast in the morning
 1. is especially recommended during cold weather
 2. makes one more alert and more effective at work
 3. makes it easier to properly distribute the foods required in one day
 4. both answers number 2 and 3 are true
9. A good breakfast in the morning could include a fruit juice, tea or coffee and
 1. buttered toasts and banana
 2. buttered toasts and jam
 3. buttered toasts with cheese or other protein food
 4. danish pastry with honey or syrup
10. Cholesterol is
 1. a harmful substance present in blood when one has heart disease
 2. a fatty substance made by the body or present in foods and found in the blood of everybody, even of healthy individuals
 3. a protein which is deposited in the blood vessels and which can cause heart problems
 4. a fatty substance found in vegetable oils
11. In planning daily menus for the family, it is important to
 1. include foods from all the following groups: milk and milk products, fruits and vegetables, meats, bread and cereals
 2. consider the food preferences of the family members
 3. vary the foods included in the meals
 4. the above three answers are true (correct)
12. Which vitamin is required to utilize calcium and phosphorus for bone growth during childhood?
 1. vitamin A
 2. vitamin B
 3. vitamin C
 4. vitamin D
13. The energy expenditure required for intellectual work is
 1. enormous
 2. high
 3. moderate
 4. negligible

14. Adults gain weight because
 1. they eat more than they use up
 2. overweight is hereditary
 3. they like sweets
 4. overweight is unavoidable with age
15. An adolescent who eats well and practices sports
 1. has a well developed musculature
 2. avoids overweight
 3. keeps his whole system functioning well
 4. the above three answers are true (correct)
16. It is recommended to use the liquid of canned vegetables because it contains
 1. only vitamins
 2. vitamins and minerals
 3. salt only
 4. only proteins
17. During cooking, fruits retain more nutrients than vegetables because
 1. fruits are cooked at a lower temperature than vegetables
 2. the cellulose in fruits is more resistant than the cellulose in vegetables
 3. fruits are usually less acid than vegetables
 4. the fruit juice or syrup is usually served with the fruit
18. Freezing certain foods is a method to
 1. keep their nutritive value
 2. make them easier to digest
 3. keep them indefinitely
 4. improve their flavor and color
19. The major daily contribution toward one's vitamin requirements comes from
 1. a varied and well balanced diet
 2. green vegetables
 3. milk
 4. liver

20. Which group of foods is generally regarded as a good source of vitamin C?
 1. bread and cereals
 2. citrus fruits and green vegetables
 3. milk and milk products
 4. fruits and vegetables in general
21. Cod liver oil is an excellent source of
 1. thiamine
 2. riboflavine
 3. vitamin C
 4. vitamin D
22. Sunlight can help one stock up on
 1. vitamin A
 2. vitamin B
 3. vitamin C
 4. vitamin D
23. Water is an essential part of our diet because
 1. it replaces the two cups of water lost daily by the body
 2. after oxygen, it is the most vital need of the body
 3. it accounts for 1/3 of the body weight
 4. it is a very good source of minerals
24. Energy is
 1. a reaction pattern
 2. a regulatory substance in the body
 3. a force derived from the transformation of foods within the body
 4. an essential part of each cell in the body
25. Vegetable proteins are of a poorer quality than animal proteins because
 1. they contain less energy
 2. they slow down digestion
 3. they lack certain amino acids
 4. they contain less fat

Please fill in the following information:

1. Have you attended a nutrition class in an Adult Education program? Yes _____ No _____
2. Age _____
3. Male _____ Female _____
4. Number of years of formal education:
Attended school less than 12 years _____
Attended school 12 years or more _____

Thank you for completing this questionnaire.