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To the Graduate Council:

I am submitting herewith a dissertation written by Carolyn Patricia Parks entitled "An Investigation of Nutrition Knowledge, Beliefs and Dietary Intake of Women in a Poor Community as a Basis for Nutrition Education." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

James Neutens, Major Professor

We have read this dissertation and recommend its acceptance:

Mary Ann Blass, Robert Kirk, Ian Rockett, Vincent Jones

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

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James J. Neutens, Major Professor

We have read this dissertation
and recommend its acceptance:

Ron Rodey

Mary A. Bass, Anthro

Vincent M. Jones

Robert H. Kirk

Accepted for the Council:

Associate Vice Chancellor
and Dean of the Graduate School

AN INVESTIGATION OF NUTRITION KNOWLEDGE, BELIEFS AND DIETARY INTAKE OF WOMEN IN A POOR COMMUNITY AS A BASIS FOR NUTRITION EDUCATION

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Carolyn Patricia Parks

May 1993

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DEDICATION

This work is humbly, gratefully and lovingly dedicated to

"The Center of My Joy" -

my Lord and Savior, Jesus Christ,

whose Power and Spirit guided, sustained, and lifted me

through the exhilarating highs and

extreme lows of this project.

"There is no equal to you, O God!"

ACKNOWLEDGEMENTS

A study of this nature and magnitude, especially in the targeted population, could not have been accomplished without assistance and support from various sources. I wish, therefore, to acknowledge the following individuals and organizations for the specific roles they played in making this research possible.

Dr. James J. Neutens, committee chair and mentor, who guided me through both the master's and doctoral degrees - for his constant challenge, "tough" questions, patient understanding, and exemplary model of professional excellence in health education research and practice.

My committee - Dr. Mary Ann Bass, for the initial concept of this project generated through her *Nutritional Anthropology* course, and for the "female perspective" on things; Dr. Robert Kirk, for editorial assistance; Dr. Ian Rockett, for support and sensitivity especially during the very "low" times, and for demanding professional excellence; and Rev. Dr. Vincent Jones, also my pastor during the initial phases of the study, whose vision for the unmet needs of the MLB area and pioneer work provided both contacts and a point of entry into the community.

Dr. Jeanne Skinner, Department of Nutrition and Food Sciences, University of Tennessee - for exposure to high quality KAP literature and researchers in nutrition, many of which served as references and judges for this study; for directing my germinating research ideas in her courses; and for extreme sensitivity and understanding.

The women of the MLB housing developments - for patiently answering the lengthy survey in the face of their daily struggle for human dignity and justice.

The office managers and Tenants Association presidents of the four housing developments in MLB - for assistance and direction regarding implementation; extra special thanks to Julia Chesson, Annie Dorsett, Diane Evans, and Mr. Dave Miller of the Family Enhancement Program at Western Heights.

The late Mr. Glenn Ford, Program Administrator in Housing, Knoxville Community Development Corporation - for providing the housing development information which served as the sampling frame for the study.

The judges who reviewed the initial draft of the study instrument and offered invaluable suggestions.

My colleagues at Cleveland State University - for encouragement and advice; special thanks to Drs. Suzanne Kryder and Sanza Clark for friendship and guidance; Dr. Richard Hurwitz, department chair, for unfailing support and relieving me of many duties to complete this work; and Wanda Pruett-Butler and Joan McCauley, department secretaries, for being sympathetic listeners and for "covering" my many faulty tracks over the last two years.

The officers and members of the Word of Life Bible Fellowship, Philadelphia, PA, Rev. Ronald Parks, pastor, my home church and spiritual support base - for on-going prayers, encouragement and financial assistance. Thanks Ron, for being there!

The officers and members of the Clinton Chapel A.M.E. Zion Church, Knoxville, TN, Rev. Joel Miles, pastor - for "taking me under their wing," and

providing prayerful and financial support; extra special thanks to my two "Moms," Mrs. Lillian McMullen and the late Mrs. Frances Lewis, for always making sure I had a good meal, gas in my car, and $5.00 in my pocket.

The Keystone Baptist Church, Chicago, IL, Rev. Lloyd Lindo, Pastor - for financial support. Extra special thanks to Rev. Malcolm White, Campus Minister - for unfailing friendship and constant encouragement, and for "finding" needed financial support at very strategic points throughout my educational pursuits.

Rev. Nathaniel Winslow, pastor, New Testament Church of Christ, Philadelphia, PA, - for being one of the first leaders to embrace my "health vision," and for spiritual guidance and financial assistance during the very difficult early years of my educational endeavors.

The Christian Community Health Fellowship Board of Directors, Dave Caes, Executive Director - for the forum through which to present and discuss many of the principles implemented in this study.

These special friends - who did not become "fair-weather" during the course of this project and provided spiritual, moral, financial, and/or housing support at very strategic points during this study: Cassandra April, Pamela Brown, Devra Doolin, Dr. Deborah Fortune, Dr. and Mrs. Moses Goldmon, Montina Jones (things did work out!), Lovina Joseph, Teresa Maldonado, Philip Marshall, Jeannie Musik, Dr. Marianne O'Brien, Rebecca Snider, Derrick Stapleton, Dr. E. Dawn Swaby-Ellis, Rev. William A. Taylor, and Elizabeth Tunning.

Sincere thanks to those family members and friends, too numerous to name, who sent large or small financial gifts to keep my head above water, sent cards or letters to encourage me or called to keep my spirits strong.

My two dearest and best friends - Dr. Vanessa Wynder Quainoo, who was always there, especially through the tears, with an encouraging word, a good laugh, financial help, and a strong "kick" to keep me going; and Mary E. Williams, for the perpetual cards, letters, love, "play money," and constant reminders of "you can do it" and "I'm praying for you." You two are tops!

To the memory of my late grandfather, Rev. John W. Porter, "Poppie," - whose exemplary life and unfailing love helped to shape the person I have become, and whose presence was felt, especially during the dark days of this work.

Most importantly, my wonderful family: my parents, Mr. and Mrs. Richard J. Parks, Sr.; my siblings, Willie and Christine, Richard, Judith, Ronald and Denise, John, and Eleanor; and my darling nieces and nephews, Caprice, Willie, Christopher, Kimberly, Catherine, Bryant, and Chante - for their powerful love, constant support, unceasing prayers, affirming pride, and sacrificial financial assistance throughout my educational pursuits. I could not have done it without you! Special love and heartfelt thanks to each of you.

I am eternally grateful to you all for helping me fulfill this life calling.

ABSTRACT

A descriptive and exploratory design was employed to investigate nutrition knowledge, beliefs and dietary intake in poor women, using the health belief model, as a basis for developing a culturally relevant nutrition education program. Women from four housing developments in a metropolitan southern city were studied.

Twenty-four judges in nutrition, health education, poor populations of color, and communication were utilized to establish content, cultural and linguistic validity of the knowledge and beliefs instruments. Statistical analysis showed sufficient reliability: knowledge test - .88 (KR-21) and beliefs scale - .90 (Cronbach's alpha). Alpha reliabilities for beliefs subscales, except seriousness (.49), were also acceptable (.56 to .81). The instrument was pilot-tested twice in the population and revised.

A non-representative sample of 100 women was obtained from a sampling frame of inhabited units in the four developments. Participation criteria were: being age 18 years or older, current development residency, and primary food caretaker. The sample was predominately African-American (81%), single (53%), below age 45 (72%), high school graduates (45%), and homemakers (43%).

Personal or group interviews were conducted by the researcher and three trained resident interviewers on: 1) nutrition knowledge, related to the Dietary Guidelines and Objectives for the Nation; 2) nutrition beliefs, as measured through the six original constructs of the HBM; 3) dietary intake status and behaviors; and 4) other relevant information.

Results showed below average nutrition knowledge (69.5%), especially regarding diet-disease linkages. Strong positive perceptions existed for susceptibility, seriousness, benefits, and motivation constructs. However, many barriers to nutritional adequacy were reported, namely: lack of transportation, religious beliefs, and lack of trust in health authorities. A positive moderate correlation existed between nutrition knowledge and beliefs (.53). Subjects showed below average to average intake for the five food groups and water, and a mixture of positive and negative dietary patterns regarding current nutritional recommendations. All of the nutrition-related disorders were reported, with teeth problems, obesity, hypertension, diabetes, and heart disease being most prevalent. Subjects exhibited strong misperceptions about personal obesity.

The housing development population was identified as a typical hard-to-reach population, with unique characteristics and perceptions to be considered during program development. Several obstacles encountered forced major methodological adjustments at various points throughout the study.

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CHAPTER I

INTRODUCTION

The value of adequate nutrition for securing good health has been generally accepted. A healthy diet is recognized as one of several lifestyle components necessary for the development and maintenance of optimal well-being (U.S. Department of Health, Education and Welfare [USDHEW], 1979). To achieve this end, the diet must minimize the risk of all nutrition-related diseases by concurrently providing adequate amounts of the essential nutrients and lowering risk of diseases associated with overconsumption (Hegsted, 1984).

In recent years, the focus in nutrition has been directed at dietary patterns identified as linked to several major chronic diseases in the United States. In fact, five of the ten leading causes of death - coronary heart disease, stroke, diabetes, atherosclerosis, and some forms of cancer - have been shown to have a dietary component contributing to their development. These account for over two thirds (or 1.5 of 2.1 million) of all U.S. deaths. Three other major causes of death - cirrhosis of the liver, accidents and suicides - have been associated with excess consumption of alcohol. Additionally, dietary inadequacy may contribute to other health problems prevalent in the United States, such as obesity, osteoporosis, hypertension, dental diseases and gastrointestinal disorders (United States Department of Health and Human Services [USDHHS], 1988). Collectively, these diet-related conditions inflict

a tremendous health care, illness and economic burden on the American population (Cumming, 1986).

In response to this growing evidence, several federal health documents published between 1977 and 1985 outlined specific dietary goals and recommendations which focus on risk reduction for the major chronic diseases (U.S. Department of Agriculture [USDA], 1980, 1985; USDHEW, 1979; USDHHS, 1980; U.S. Senate, 1977). In 1988, the first national report on nutrition and health (USDHHS, 1988), by Surgeon General C. Everett Koop, was written in response to the increasing strength of research which indicated that the major nutritional problems among Americans result from dietary excesses and imbalances rather than deficiencies of single nutrients (Nestle, 1988). Dr. Koop stated: "For the two out of three adult Americans who do not smoke or do not drink excessively, one personal choice seems to influence long-term health prospects more than any other: what you eat" (USDHHS, 1988).

The more definitive identification of a strong association between dietary patterns and health has made the area of nutrition a popular topic to address both by health professionals and the media. The American public has been bombarded with nutrition information and advice on the need to alter dietary attitudes and practices to improve health and reduce disease risk. This plethora of information is believed to have impacted the dramatic increase in public awareness of and interest in nutrition issues (National Center for Health Statistics, 1990; Sloan, 1987), as well as altered some nutrition attitudes and behaviors (Owen, 1988; Stamler, 1985). According to Sloan (1987), it has helped create a public that: understands the fundamentals of

nutrition, is motivated to practice good eating habits, and is desirous of more sophisticated and precise nutrition information.

Despite these widespread efforts and improvements, there yet exists among Americans many gaps in their knowledge, understanding and practice of various nutrition-related concepts (Flynn & Sade, 1989; Owen, 1987; Sloan, 1987; Stephenson, Levy, Sass, & McGarvey, 1987; USDHHS, 1986b). Furthermore, nutrition education programs and information dissemination efforts have not been as successful in reaching key needy segments of the U.S. population, namely African-Americans and other populations of color and persons of low socioeconomic status (Stamler, 1985; USDHHS, 1985b). This disparity is crucial since people of color and the poor are believed to:

1. have inadequate knowledge about health and nutrition issues in general (Gillium & Gillium, 1984; Herman, 1972; Littlejohn & Schulman, 1985; Weaver, Herrick, Ramirez, & Deatrick, 1978; Williams, 1979);
2. possess different beliefs regarding health and nutrition matters (Semmes, 1983; Snow, 1983);
3. have dietary practices which may compromise nutritional status (Kumanyika, 1990; National Dairy Council, 1988);
4. be more vulnerable to the misinterpretation of nutrition claims in food advertisements (Vermeersch & Swenerton, 1980); and
5. lack a clear understanding of relationships between diet, health and disease (USDHHS, 1986a).

In addition, people of color, especially African-American females, and persons of low socioeconomic status, show a higher than average rate for nearly all of the diet-related chronic diseases prevalent in the United States (Kumanyika, 1990; National Dairy Council, 1988; USDHHS, 1985). These facts, therefore, identify poor African-American females as a primary target group for nutrition education efforts.

Often, health programs are developed according to the "machine model," whereby program goals, structure, objectives and activities are established to address problems identified by professionals who may differ greatly from their target groups (Rody, 1988). Use of this approach among diverse populations usually results in ineffective and culturally inappropriate programs. Rarely are the specific cultural values, beliefs and attitudes of these groups considered in the design of health promotion programs. This is despite the fact that they may play an important role in explaining differences in behavioral risk and increased mortality between Whites and non-Whites (Gottlieb & Green, 1987).

Nutrition education programs, specifically, are often planned and implemented without adequate knowledge and understanding of the target group. This oversight is detrimental to nutrition issues, as food behaviors are influenced by numerous factors (Bass, Wakefield & Kolasa, 1979). Also, American eating patterns, despite general appearances, are far from homogeneous (Kolasa & Bass, 1974). Thus, nutrition education efforts must be tailored directly to the population being addressed.

According to Ritchie (cited in Kolasa & Bass, 1974): "Nutrition education cannot be successful unless based on a knowledge of the attitudes, beliefs and values

of the people to be influenced...". Information is also needed on: the current level of nutrition knowledge in the population to identify and correct misconceptions; existing dietary behaviors to identify those areas requiring or most amenable to change; and relationships between these various factors. This information, when combined with other relevant information on the foodways of a population, will give the health educator:

1. a more accurate assessment of factors which influence nutrition matters in general;
2. clues for the development of effective, culturally relevant interventions based on the specific needs, problems, interests and beliefs of the population;
3. more definitive identification of subgroups in the population with special health education needs; and
4. information on positive aspects of dietary knowledge, attitudes and behaviors, and gaps needing to be filled.

The health belief model (HBM) has been suggested as a potentially effective needs assessment tool for health education programs (Janz & Becker, 1984; Jette, Cummings, Brock, Phelps, & Naessens, 1981; Simon & Das, 1984). An exploration of nutrition knowledge, beliefs, and dietary intake through the constructs of the HBM can provide an approach to assessing educational needs that would permit the development of a nutrition education program tailored for the needs of specific target groups (Jette et al., 1981). Such an exploration would also permit the documentation

of the necessary procedures for studying hard-to-reach or newly identified target populations.

I. STATEMENT OF THE PROBLEM

The purpose of this study was to delineate the process of investigating nutrition knowledge, nutrition beliefs and dietary intake of poor women in housing developments, using the health belief model, as a basis for developing a nutrition education program. The following issues and tasks were addressed:

1. The identification of a theoretical framework for investigating nutrition knowledge, beliefs and dietary intake in poor women.
2. The construction of a culturally relevant instrument to assess nutrition knowledge, beliefs and dietary intake in poor women.
3. The administration of a nutrition instrument to poor women in housing developments, including the selection and use of resident interviewers.
4. The identification of characteristics of poor women residing in housing developments which impact the research process.
5. A description of nutrition knowledge, beliefs and dietary intake patterns of poor women.
6. An exploration of associations between the HBM constructs and nutrition knowledge and dietary intake of poor women.

7. The identification of other relevant information required for developing a nutrition education program for poor women living in housing developments.

8. A description of obstacles encountered and adjustments required when investigating a housing development population.

II. NEED FOR THE STUDY

In an era of nutrition information explosion, a study to explore nutrition knowledge, beliefs, and dietary behavior of a population appears rudimentary and simplistic. On the contrary, such a study could serve as the basis for developing appropriate nutrition education interventions for a population (Warren, Hillers, & Jennings, 1988). It should be an essential forerunner to program development in order to ascertain actual rather than assumed audience needs and interests. It also serves to identify acceptable channels for educational efforts in the target group. Community survey research has been identified as a reliable source of information for the planning, implementation and evaluation of public health education programs. Such studies are especially needed among diverse populations, as public health information may not have adequately reached their communities, enhanced their understanding, or affected their lifestyles (Weaver et al., 1979).

Nutrition studies of all types abound, including those which have extensively investigated dietary knowledge, attitudes and practices in various populations. Studies of the nutritional status, food preferences, and to some extent, dietary patterns of low

socioeconomic African-Americans are also quite prevalent. However, research specific to nutrition knowledge and beliefs of this population is practically non-existent. This creates a wide gap in our understanding of the contribution of these factors to the foodways of this group. In addition, many of the aforementioned studies are dated. Hence, there is limited current information regarding key nutritional issues in this population.

According to Moon and Twigg (1988), lack of baseline data on nutrition and other relevant health issues is a major problem in health education. Such information is central to planning, targeting, implementing, and evaluating nutrition programs. Lack of these data result in limited detailed knowledge about the public's misconceptions in dietary knowledge, nature of dietary practices and willingness to change these areas. Baseline data, therefore, serve as a record of current dietary knowledge and practices, and as a yardstick against which to measure proposed or observed changes.

Besides limited research in this area, many studies which address nutrition issues among low socioeconomic groups largely utilize individuals enrolled in one of the federal food assistance programs, such as the Food Stamp Program, the Expanded Food and Nutrition Education Program (EFNEP) or Women, Infants and Children Program (WIC). Although these represent low socioeconomic populations, they reflect a select group, as many poor persons may not participate in or be eligible for these programs. As a result, a significant portion of a community may be excluded from study. When exploring foodways within a low socioeconomic population, the

community itself should be targeted, or a broader subset of it. One such subset would be individuals who reside in public housing developments. While they too represent a select group of low socioeconomic people, they constitute a broader base of the poor than WIC or EFNEP participants. The composition and structure of housing projects make them a key research setting for exploring health issues among low socioeconomic populations of color (Leigh & Mitchell, 1988; Matulef, 1987). Housing development residents may also be at a higher risk for various health problems and have greater misperceptions about health issues than residents of the surrounding poor community (Rivo et al., 1992).

The nutritional vulnerability of African-Americans of low socioeconomic status is well-recognized. Various studies on their nutritional status reveal its relative inferiority when compared with Whites and other populations. Weaknesses appear to be primarily in the areas of: nutritional adequacy; vitamin and mineral deficiencies; caloric intake; and excess consumption of foods high in fat, cholesterol, sodium and sugar (Block, Rosenberg & Patterson, 1988; Haider & Wheeler, 1979; Koh & Caples, 1979b; Malina, 1973; National Dairy Council, 1988; Perkin, Crandall & McCann, 1988; Resurreccion & Pagruo, 1988; USDHEW, 1972). Irregular eating patterns, low or negative ratings for meals and the four food groups (Malina, 1973), low socioeconomic status, poor education, poor food choices (Haider & Wheeler, 1979), and consumption of more calorie dense foods (Resurreccion & Pagruo, 1988) have all been identified as major factors in the prevalence of substandard nutrition among African-Americans.

According to Malina (1973), the nutritional status of a community is closely intertwined with many factors. The considerable interrelatedness between nutrition and health status is emphasized by the generally synergistic effects of poor nutrition and disease. Further convincing evidence of nutritional vulnerability among low socioeconomic African-Americans is reflected in the disproportionate number who experience various nutrition-related diseases.

One of the major nutrition-related problems among African-Americans is obesity, particularly among African-American females. According to the National Center for Health Statistics, an estimated 48% of African-American women are overweight, compared to 26% of White women, 30% of African-American men and 25% of White men. Although women of low socioeconomic status are at highest risk, these excess rates are observed in every age category, from 25-75 years, and across all socioeconomic strata. This high rate of obesity is believed to be a major factor predisposing African-American women to the development of several obesity/ nutrition-related disorders in disproportionate numbers, including heart disease, hypertension, cerebrovascular disease, diabetes, and cancers of the breast, cervix and uterus. A combination of genetic and environmental factors has been implicated in the excess rate of obesity among African-American women (Kumanyika, 1987).

Hypertension is the most prevalent chronic disease among African-Americans. Thirty-eight percent of the African-American population aged 18-74 years is hypertensive, in contrast with 29% of Whites and about 30% of the total population. African-Americans tend to develop hypertension much earlier and experience more

severe consequences from it (National High Blood Pressure Education Program, 1985). Closely associated with uncontrolled hypertension is stroke. African-Americans have a 66% higher mortality of stroke than Whites, which represents the second highest stroke mortality in the world next to the Japanese (Hall, Saunders & Shulman, 1985). Excess sodium intake has been suspected as a contributing factor in the high prevalence of both hypertension and stroke in African-Americans. Of particular concern is the notion that many African-Americans may possess a less efficient pattern of sodium excretion. Since sodium consumption among African-Americans has been identified as excessive, the need to develop effective community-wide nutritional strategies for reducing its use among them has been duly noted (Kumanyika & Bonner, 1985).

Other important nutrition-related diseases prevalent among African-Americans further demonstrate health disparity and the need for more definitive investigation of dietary issues among them. Diabetes mellitus is 50-60% higher in African-Americans than in Whites, and considered epidemic among African-American women, with one in four over the age of 55 years afflicted. While its prevalence has been stable for Whites since the mid seventies, it has grown dramatically among African-Americans. There has been a four-fold increase in the number diagnosed with diabetes from 1963 to 1985. This high prevalence, like obesity, prevails across all sociodemographic parameters. African-Americans experience higher rates of three of the severe complications of diabetes: blindness, amputation and end stage renal disease (National Diabetes Information Clearinghouse [NDIC], 1989). They also have a higher mortality

rate than Whites, again, with African-American females affected most. Obesity is believed to be the major risk factor predisposing African-American women to these high rates (Smith, 1988). In addition to research on diabetes in African-Americans, it has been recommended that research be conducted to assess the relationship between dietary and cultural influences in the African-American community and the development of diabetes (NDIC, 1989).

Low socioeconomic groups and African-Americans have higher age-adjusted cancer incidence and mortality rates than any other groups in the U.S. (Freeman, 1989; Hargreaves et al., 1989). Excesses of 11% in incidence and 27% in mortality have been reported for African-Americans as compared with Whites. Early diagnosis of localized cancer is 10% greater for Whites than African-Americans. Also, survival rates for African-Americans are less than those of Whites at all stages of the disease. Dietary and nutritional factors, including increased incidence of obesity, greater consumption of animal fats, less fiber, fewer fruits and vegetables, and lower nutritional status regarding thiamine, riboflavin, iron, and vitamins C and A, are believed to be associated with higher cancer incidence and mortality in African-Americans (Hargreaves et al., 1989).

Cardiovascular disease mortality in the United States has steadily decreased in recent decades. While national data indicate the prevalence of coronary heart disease in African-Americans and Whites to be similar, there exists an excess of deaths attributed to the disease in African-Americans. The excess mortality is more marked in African-American females. While a paucity of studies of cardiovascular disease

and its risk factors in African-Americans inhibits adequate explanation of the differences, some reports suggest that pandemic obesity and lower HDL levels might explain the higher coronary heart disease mortality in African-American women (USDHHS, 1986a).

Although few studies exist on alcohol and African-Americans, there is evidence that alcohol abuse has a major impact on their health. Using cirrhosis deaths as an indicator of high alcohol consumption, cirrhosis mortality has declined consistently among all race-sex groups in the United States since 1973. But they are still disproportionately high among African-Americans. Overall, the cirrhosis mortality rate for African-Americans is almost twice that of Whites, and second to that of Native Americans. Death rates for chronic liver disease and cirrhosis are about 29% for African-American males and 14% for African-American females, versus 15% and 7% for White males and females, respectively. African-Americans also suffer disproportionately from the health consequences of alcoholism, including esophageal cancer (USDHHS, 1985b).

In addition to extensive prevalence of various chronic diseases, there exists among African-Americans an apparent lower level of knowledge concerning nutrition issues in general and relationships between diet and health (USDHHS, 1986b). There also appears to be a tendency to fail to apply existing nutrition knowledge. These characteristics are most evident among the poor (Koh & Caples, 1979a; Price, Desmond, Wallace, Smith, & Stewart, 1988a; Weaver et al., 1978; Williams, 1979). Although some studies suggest improvements in awareness in certain areas of health

among people of color, knowledge related to risk reduction behavior is believed to lag considerably behind awareness of risk factors (Kumanyika et al., 1985).

The overwhelming evidence of nutritional vulnerability, excess nutrition-related morbidity and mortality, and inadequate nutrition knowledge among poor African-Americans demonstrates the need for expansion of our understanding of their foodways. Existing research on food preferences and nutritional status provide solid evidence of food choices and nutritional deficiencies among poor African-Americans. However, it gives little information about specific knowledge levels and beliefs which might lead to these choices and deficiencies. Identification of these areas are of particular importance when developing a health education program. This information would serve as the foundation upon which to establish meaningful program goals and objectives, to select appropriate content and learning opportunities, and to evaluate program effectiveness.

The foregoing evidence also clearly points to the need for culturally relevant nutrition education programs for poor African-Americans. Many programs rarely reflect the normal eating patterns, foods, attitudes, and purchasing habits and constraints of poor persons of color (Ford & Harris, 1988). A nutrition education program has the potential to impact these individuals in a community when it is designed to reflect their particular cultural, ethnic, and socioeconomic factors (Fortmann, Williams, Hulley, Haskell, & Farquhar, 1981; Fortmann, Williams, Hulley, Maccoby, & Farquhar, 1982; Stern, Farquhar, Maccoby, & Russell, 1976).

Finally, the HBM is an excellent tool for exploring both the existence of particular beliefs regarding a health issue and relationships between those beliefs and other key factors which influence behavior. The model has been fairly well-tested, thereby, producing a solid data base for exploration of the model constructs. While the model has been used extensively to explain and predict a wide range of compliance and preventive health behaviors in various populations (Janz & Becker, 1984), its use in the area of nutrition, with low socioeconomic groups, and among African-Americans and other populations of color has been limited. Also, the vast majority of HBM studies are retrospective and geared towards prediction of particular behaviors versus explanation of factors for the purpose of educational diagnosis (Simon & Das, 1984). This study, therefore, contributes to the HBM literature on three levels: the use of the model in the area of nutrition, among African-Americans and the poor, and as a diagnostic tool for program development.

III. LIMITATIONS

The following limitations were imposed on the study:

1. The data were limited to the respondents' ability to be aware of and accurately report their nutrition knowledge, beliefs, and dietary intake.
2. Participation in the study was restricted to those residents in the four housing projects whose homes were not being remodeled during the course of the study and who were able to contacted.

IV. DELIMITATIONS

The following delimitations were established for the study:

1. The study was limited to adult female residents of the public housing developments in the Mechanicsville, Lonsdale, Beaumont (MLB) section of Knoxville, Tennessee: College Homes, College Hills, Lonsdale Homes, and Western Heights.
2. The study was limited to females 18 years of age or older who designated themselves as the primary person responsible for food matters in the home.
3. The study was limited to exploration of six HBM constructs - perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and general health motivation - and selected modifying factors.

V. DEFINITIONS

The following definitions were operationalized for this study. All HBM dimensions, except general health motivation, were operationalized according to Rosenstock (1974b).

Adults - persons aged 18 years or older.

Nutrition Knowledge - the level of awareness and understanding of basic nutrition information and principles, as measured by the Nutrition Knowledge Test.

Nutrition Beliefs - the subjective feelings of an individual regarding nutrition matters and nutrition-related diseases, as measured by the Nutrition Beliefs Scale.

Dietary Intake - the types and frequency of foods consumed by an individual, as measured by the Dietary Intake Food Frequency Scale.

Other Relevant Information - a combination of additional personal and community health information important to the development and implementation of a nutrition education program in a population.

Nutrition Education Program - a form of planned change that involves a deliberate effort to improve nutritional well-being by providing information and other types of educational/behavioral interventions...with an emphasis on dietary behavior change as a result of the educational intervention (Sims, 1988).

Perceived Susceptibility - the perceptions of the individual regarding the likelihood of personal vulnerability to a particular health condition.

Perceived Seriousness - the perceptions of the individual about the seriousness or severity of a given health condition.

Perceived Benefits - the perceptions of the individual about the effectiveness of various available alternatives in reducing the disease threat to which the person feels susceptible.

Perceived Barriers - the perceptions of the individual concerning the potential negative aspects of a particular health action.

Cues to Action - a factor which serves as a cue or trigger to appropriate health action.

General Health Motivation - the differential emotional arousal in an individual caused by some given class of stimuli (for example, health matters) (Becker, Drachman, & Kirscht, 1974) or the need or desire for achieving health-related goals (Maiman & Becker, 1974).

Modifying Factors - various demographic, sociopsychological, and structural variables which serve to condition individual perceptions and the perceived benefits of preventive actions.

VI. SUMMARY

This chapter presented the need for a study to explore, through the constructs of the HBM, the process of investigating nutrition knowledge, beliefs, and dietary intake among poor women as a basis for developing a culturally relevant nutrition education program. The need for the study was identified in the following areas: the paucity of research which examines nutrition knowledge and beliefs among poor women of color; nutritional inadequacy, lower dietary knowledge, and higher rates of nutrition-related morbidity and mortality among these women; and limited prospective HBM studies in the area of nutrition, among the poor and among women of color.

The statement of the problem, with its accompanying issues and tasks, were delineated. Limitations and delimitations were established. Definitions, as used in this study, were outlined.

CHAPTER II

REVIEW OF THE LITERATURE

This review of the literature addressed the following areas: 1) the health belief model (HBM) as a theoretical framework for health studies; 2) applications of the model; 3) methodological issues regarding use of the model; 4) nutrition knowledge, beliefs and dietary intake among poor women of color; 5) the effectiveness of nutrition education programs; and 6) public housing developments as health education research and program sites.

I. THE HEALTH BELIEF MODEL AS A THEORETICAL FRAMEWORK FOR HEALTH STUDIES

Historical Background

The HBM was originally developed in the 1950's by social psychologists in the Public Health Service - Irwin M. Rosenstock, Godfrey M. Hochbaum, S. Steven Kegeles, and Howard Leventhal. The model was developed in an attempt to understand widespread failure of people to accept free or low cost disease preventives or screening tests for early detection of asymptomatic diseases (Rosenstock, 1974b).

Development of the model was greatly influenced by the social psychological theory of Kurt Lewin (Rosenstock, 1974b). Lewin suggested that individuals live in a life space composed of regions, which may have either positive valance, negative valance or may be neutral. A positively valued region contains a goal object and will

reduce tension for the person entering it. Conversely, a negatively valued region does not contain a goal object and will increase tension for the person entering it (Mikhail, 1981). Diseases in the life space represent regions of negative valence. These exert a force moving the individual away from that region, unless doing so would require the person to enter a region of even greater negative valence. The daily activities of the person were viewed as a process of being pulled by positive forces and repelled by negative ones (Rosenstock, 1974b).

The origin of the HBM is attributed to a special case of the Lewinian theory of goal setting in the level-of-aspiration situation (Maiman & Becker, 1974). Level-of-aspiration is the degree of difficulty of attainment of the goal toward which a person is striving. The choice between various levels of difficulty is made on the basis of the relative valences of these levels for success or failure, and the subjective probability of success at each level. Success which is highly improbable will not be chosen over reasonably probable success even though the improbable success is much more highly valued. Most people tend to aspire to levels that are close to or slightly higher than their performance level in the past. However, the valence of any level is both culturally and personally determined. Lewin hypothesized that behavior depends primarily on two variables: 1) the value of an outcome to an individual and 2) the person's estimate of the probability that a given action will result in that outcome (Mikhail, 1981).

The original formulation of the HBM extended the use of Lewin's theory to explain preventive health behavior. The model possesses a phenomenological purpose,

and assumes that the subjective world of the perceiver determines behavior rather than the objective environment, except as the objective environment is represented in the mind of the behaving individual. A person can only act on what he or she believes to exist, even though this may not match professional viewpoints. The model is more concerned with the current subjective state of the individual than with history or experience (Rosenstock, 1974b).

In attempting to explain health behavior, the HBM proposes that the likelihood of a person taking health action is determined by three primary factors:

1. individual perceptions of personal susceptibility to a particular health condition;
2. individual perceptions of the severity of the consequences of contracting the condition; and
3. the extent to which the course of action is perceived as beneficial in reducing the susceptibility and severity of the condition, and produces no or minimal psychological barriers (Rosenstock, 1974b).

According to Rosenstock (1966), motivation is required for perception and action. People who are unconcerned about a particular aspect of their health are not likely to perceive any material that bears on that aspect of health. Motives also determine how the environment is perceived.

Becker, Drachman and Kirscht (1974) categorized the model as an "expectancy x value" theory, attempting to describe behavior or decision-making under conditions of uncertainty. In this approach to health behavior, the action of the individual is

related to the subjective desire to "lower" susceptibility and severity, and to an estimation of benefits minus costs. The attractiveness of incentive value of the health action or goal to the individual is its ability to "lower" the person's perceived susceptibility to a given illness and/or reduce consequential severity of the illness. The expectancy variable is conceived as a quantitatively varying belief that some perceived likelihood of successfully attaining the goal or the expectancy of success of the health action is a function of the perceived benefits of taking the health action minus the barriers or costs of that action. The incentive, expectancy and motivational variables are related to the model's outcome variable "disposition to act." While no formal mathematical model has been generated for interactions among the variables, it is likely that the relation between them is multiplicative (Maiman & Becker, 1974).

Dimensions of the Original Model

From the foregoing theoretical considerations came the development of six concepts which reflect the major dimensions of the original HBM (Rosenstock, 1974b). Figure 1 portrays the components of the traditional HBM (Becker, et al., 1974).

Perceived Susceptibility

This construct reflects individual perceptions about the likelihood of personal vulnerability to a particular health condition. Individuals vary widely in their feelings of personal susceptibility to a disease. Thus, this dimension refers to one's subjective perception of the risk of contracting a health condition (Rosenstock, 1974b).

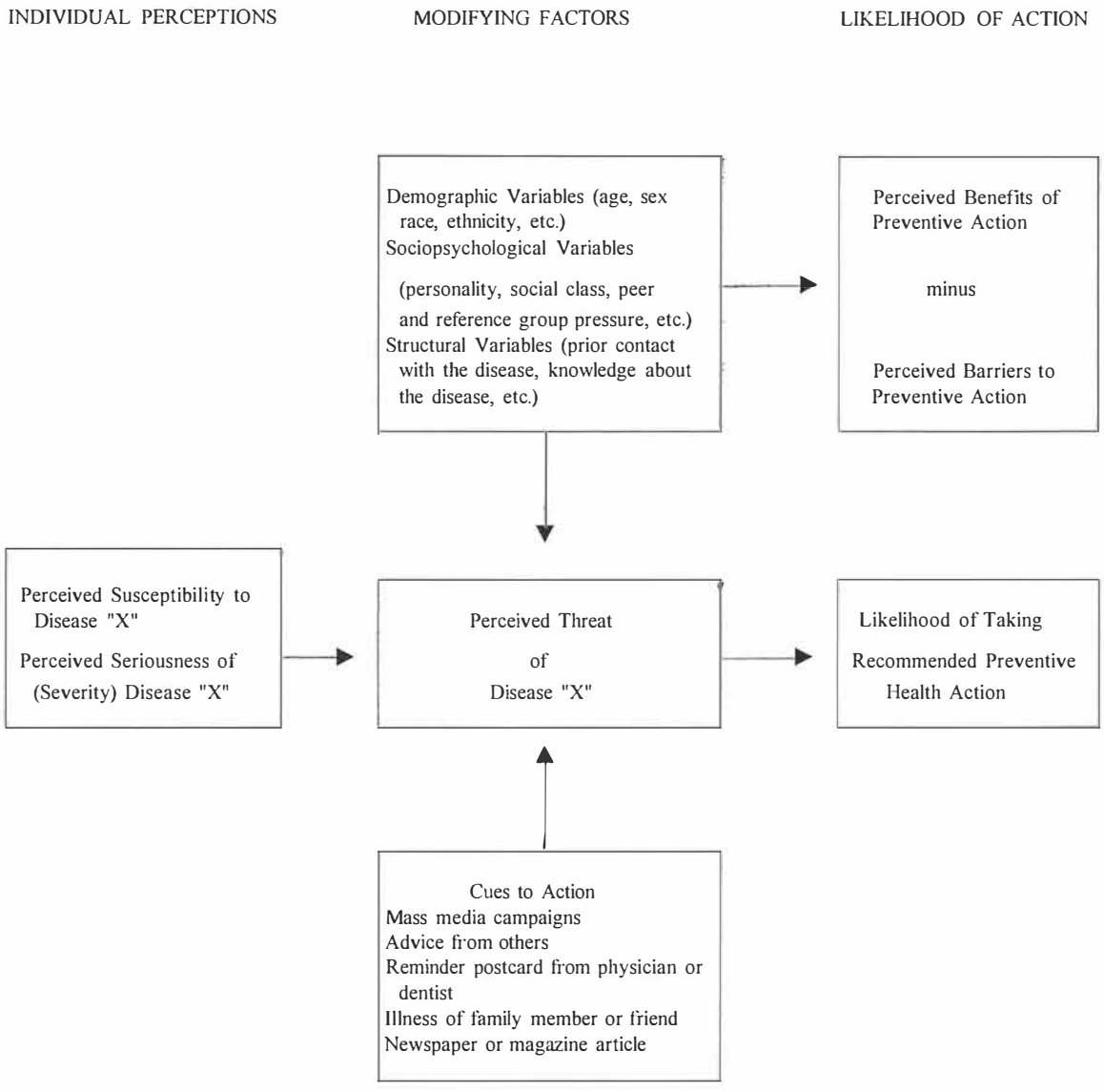

Figure 1. The original health belief model as a predictor of preventive health behavior.

Note . From "A new approach to explaining sick-role behavior in low income populations," by M. H. Becker, R. H. Drachman, & J. P. Kirscht, 1974, American Journal of Public Health, 64, p. 206.

In their review of HBM studies, Janz and Becker (1984) developed a significance ratio[1] to measure the effectiveness of the HBM dimensions explored in the studies. The susceptibility dimension received a significance ratio of 81%, and has been found to be positively related to the taking of a wide variety of preventive health actions (Mikhail, 1981).

Perceived Seriousness

This dimension, also termed perceived severity, represents an individual's perceptions regarding the seriousness of a given health problem. Like susceptibility, this perception varies from person-to-person. The degree of seriousness may be determined by both the degree of emotional arousal created by the thought of a disease and by the type difficulty the person believes a health condition will create for him or her. Perceptions may include evaluations of either medical or clinical consequences (e.g., death, disability and pain) or possible social consequences (e.g., effects of the condition on work, family life and social relations) (Rosenstock, 1974b).

The importance of the seriousness dimension as an explanatory factor in health behavior is more doubtful than the other variables, especially as related to preventive health behavior. Its role is clearer in studies of illness and sick-role behaviors (Rosenstock, 1974a). A significance ratio of only 65% was reported for this dimen-

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[1]The significance ratio is created by dividing the number of positive and statistically significant findings for a HBM dimension by the total number of studies which reported significance levels for that dimension.

sion. A ratio of 88% was reached for sick-role behavior studies exclusively, versus 59% for preventive health behavior studies. This disparity may be due to the difficulty that respondents have in conceptualizing the dimension in the absence of personal experience with the health condition, or limited variability in severity measures, as most subjects tend to view a condition as very serious (Janz & Becker, 1984).

The susceptibility and seriousness dimensions together comprise perceived threat, or the psychological state of readiness of the individual to take action. This readiness to act is defined by the person's point of view about susceptibility and seriousness rather than the professional's view of reality. Also, beliefs that define readiness have both strong cognitive and emotional components (Rosenstock, 1966).

The acceptance of personal susceptibility to a health condition that is also perceived to be serious is believed to provide the force or energy leading to action. However, they do not define the particular course of action that is likely to be taken (Rosenstock, 1974b).

Perceived Benefits of Taking Action

This component represents the beliefs of the individual about the effectiveness of available alternatives in reducing the threat of disease to which the person feels vulnerable. It defines the particular course of action likely to be taken. Action would depend on how beneficial the person believes the various alternatives would be in his or her case. An alternative is likely to be viewed as beneficial if it relates subjectively to the reduction of one's susceptibility to or seriousness of a health condition. A health

recommendation, therefore, must be perceived as being feasible and efficacious in reducing susceptibility and/or severity before action will be taken. As with psychological readiness to act, the person's beliefs about availability and effectiveness of various courses of action determines what course he or she will take, and not the objective facts about the effectiveness of the action (Rosenstock, 1974b).

The benefits dimension has been well-tested, and found to be associated with various preventive health behaviors. A significance ratio of 78% was reported for this dimension (Janz & Becker, 1984).

Perceived Barriers to Taking Action

This construct includes perceptions of the potential negative aspects of a particular health action, or the perceived physical, psychological, financial or other costs involved in the proposed action. A person may believe that a certain action will be effective in reducing disease threat, but simultaneously view the action itself as being inconvenient, expensive, unpleasant, painful or upsetting. Barriers act as impediments to taking an action and can arouse conflicting motives of avoidance. The individual weighs the effectiveness of the action against perceptions of the barriers to that action. The benefits minus the barriers, therefore, provide the preferred path of action (Rosenstock, 1974b).

Conflict resolution may take various forms based on readiness to act. If readiness is high, and the barriers seen as minimal, action is likely to occur. Conversely, if readiness is low and negative aspects are strongly perceived, the negative aspects serve as barriers to prevent action. When both readiness and barriers

are great, the conflict may be more difficult to resolve, especially when alternative actions of nearly equal efficacy are not available. In these cases, a person may experience one of two reactions. He or she may psychologically withdraw from the conflict situation by engaging in activities which do not really reduce the threat (e.g., vacillating between two choices without a decision). Or, the person may experience a marked increase in fear or anxiety, which, if strong enough, could render the person incapable of thinking objectively and behaving rationally about the problem (Rosenstock, 1974b).

The barriers dimension has been found to consistently produce positive and statistically significant results. This construct received the highest significance ratio of 89% (91% for preventive health behavior studies) (Janz & Becker, 1984).

Cues to Action

The combination of levels of readiness and perceived benefits and barriers could reach high levels of intensity without resulting in overt action, unless some event occurred to initiate the process. Thus, a stimulus or instigating event was believed to be needed to trigger the decision-making process. These events may be internal (e.g., perceptions of bodily states, symptoms) or external (e.g., media exposure, interpersonal communications, reminders from health care professionals). These stimuli serve as potential "cues" to the performance of a recommended health behavior. The required intensity of a cue deemed sufficient to trigger behavior may vary with differences in the levels of susceptibility and severity. Thus, intense stimuli would be needed to trigger a response in a person with little acceptance of

susceptibility to or severity of a disease. Conversely, with high levels of perceived susceptibility and severity, even slight stimuli might be sufficient to produce a response (Rosenstock, 1974b).

Few HBM studies have assessed the contribution of cues in predicting health behavior. This may be because the settings of many HBM studies precluded adequate measurement of the role of cues. Since some cues may be fleeting and of little intrinsic value, such as a poster in a clinic, they may be easily forgotten with passage of time. Also, people who have taken a recommended action tend to remember the impact of events preceding that behavior. These problems are particularly evident in retrospective studies of the HBM (Rosenstock, 1974b).

Modifying Factors

A number of diverse demographic, socio-psychological (personality, social class, peer and reference group pressures) and structural variables (knowledge of the disease, prior experience with the disease) may affect the perceptions of the individual regarding susceptibility, severity and the benefits of preventive actions (Rosenstock, 1974b). These, however, are not seen as directly causal of compliance (Becker & Maiman, 1975).

According to Becker and Maiman (1975), an individual holding any combination of these beliefs would have an increased probability of compliance behavior. Thus, the joint influence of the variables increases predictive power.

Some reviewers have concluded that the HBM variables provide a satisfactory explanation for the major findings in the areas of preventive health, sick role, and illness behaviors (Becker & Maiman, 1975).

Expansion of the Model

Several dimensions have been suggested for addition to or modification of the HBM since its original development. A major addition to the model was made by Becker et al. (1974), who recommended the inclusion of a separate motivational variable of "general health motivation." This variable represents the need or desire for achieving health-related goals, that is, the different degrees of readiness to undertake health actions. In this modification, motives are seen as dispositions within the individual to approach certain classes of positive incentives. The desire to attain or maintain a positive state of health and to avoid a state of illness is a dimension of health motivation (Maiman & Becker, 1974). Rosenstock (1974b) acknowledged early abortive attempts to include such a variable due to difficulty in operationalizing the concept. Thus, the recommendation of Becker and his associates served to reintroduce the motivation concept back into the model.

The HBM assumes that motivation is a necessary condition for action and that motives selectively determine individual perceptions of the environment (Maiman & Becker, 1974). The concept of motivation is measured along four dimensions: physical threat, control over health matters, attitude toward medical authority, and general health concern. The original model dealt only with negative aspects of health,

namely, the threat of a disease or condition. Thus, the general health concern dimension suggests that positive health motivations exist and account for some portion of health-related behavior (Becker et al., 1974). Health-related motivation may be seen as the "push" factor in compliance (Becker & Maiman, 1974).

The HBM was originally formulated to explain preventive health behavior. However, investigators have expanded its use to explain other kinds of health-related behaviors, such as sick-role, illness, chronic illness, and at-risk role behaviors (Mikhail, 1981). Becker et al. (1974) reformulated the model to better explain adherence to medical regimens after diagnosis of an illness, and identified several additional variables: faith in physicians and medical care; re-susceptibility or the perceived likelihood of the reoccurrence of an illness; characteristics of the therapeutic regimen itself that might hinder adherence; accuracy of the diagnosis; and subjective vulnerability to various other diseases or illnesses in general. A few additional modifying variables employed in compliance-related research have also been shown to be predictive with sufficient consistency to be included in the expanded model. These are: the patient-practitioner relationship, physician continuity, and social influence (Becker, 1974).

Four other important psychosocial factors fit conceptually within the HBM framework, but were not developed or examined in this context. These are perceived health locus of control and perceived health status (Wallston & Wallston, 1978), self-efficacy or the conviction that one can successfully execute a behavior (Bandura, 1977), and perceptions related to social approval of recommended behavior (Ajzen &

Fishbein, 1980). Each of these has demonstrated positive correlations with various health-related behaviors. Since these factors may be possible components of several HBM dimensions, their exploration in future HBM studies has been recommended (Janz & Becker, 1984). Inclusion of a perceived control variable and the importance of health variable into the model have also been proposed by Pender (1982).

Information in this section clearly identifies the HBM as an acceptable theoretical framework for the study of health-related issues.

II. APPLICATIONS OF THE MODEL

The HBM has been used to describe, explain and predict a wide range of health-related behaviors. In early studies, the model was used to address behaviors such as screening tests for tuberculosis, cervical and breast cancer, Tay Sacs disease, and heart disease; preventive dental check-ups; immunizations for polio, the flu, and cholera; use of services in the absence of symptoms; adherence to therapeutic regimens while under treatment; readiness to follow preventive health practices; participation in physical activity programs; and various dental health behaviors (Becker, 1974; Becker & Maiman, 1975; Becker, Haefner, et al., 1977; Haefner, 1974; Rosenstock, 1974a).

In recent years, the model has been used to explore contemporary health behaviors, including: Swine flu inoculation; indirect and direct risk prevention behaviors (such as seat beat use and pedestrian behavior); smoking; weight control and obesity; physical activity and exercise; drinking and driving; use of physician services

for preventive care; HMO utilization (Janz & Becker, 1984); cardiovascular disease and risk reduction behaviors (Hijeck, 1984; Janz, 1988; Ransford, 1986); cancer (Newell, Price, Roberts, & Baumann, 1986; Price et al., 1988a, 1988b); diabetes (Given, Given, Gallin, & Condon, 1983; Uzoma & Feldman, 1989); breast-feeding behaviors and breast self-examination practices (Calnan & Moss, 1984; Calnan & Rutter, 1986; Champion, 1984, 1987; Sweeney & Gulino, 1987); contraceptive behavior (Herold, 1983; Hester & Macrina, 1985; Lowe & Radius, 1987); adolescent sexuality (Eisen & Zellman, 1986; Eisen, Zellman, & McAlister, 1985); venereal disease (Simon & Das, 1984); AIDS (Manning, Barenberg, Gallese, & Rice, 1989); and bulimia (Grodner, 1991).

Use of the Model in the Area of Nutrition

While the HBM has been used to address a number of health-related behaviors, the area of nutrition has not been one of them. A few studies have explored dietary issues in various ways: as one of three preventive behaviors in a comparison of health behavior models (Mullen, Hersey, & Iverson, 1987); as one of two self-initiated health protective behaviors (Ransford, 1986); within the scope of disease control (Given et al., 1983; Kirscht & Rosenstock, 1977; Lehman, 1987/1988); and as a factor in weight control behavior (Aho, 1979; Becker, Maiman, Kirscht, Haefner, & Drachman, 1977; O'Connell, Price, Roberts, Jurs, & McKinley, 1985). A review by Janz (1988) of 13 HBM studies on selected cardiovascular risk reduction behaviors showed that none

addressed dietary factors. This is a very unexpected finding given the strong evidence which links fat and cholesterol intake with increased risk of cardiovascular disease.

According to Becker, Maiman, et al. (1977), dietary adherence is somewhat unusual in the class of health behaviors because the threat posed to health is not immediate, but instead, future-oriented and linked to other conditions. Also, appropriate actions may be practiced for non-health reasons, such as body image or social acceptance. As a result, these concepts create an interesting situation in which the constructs of the HBM can be extended and tested. To date, only one published study was identified which addressed dietary behavior exclusively through the constructs of the HBM.

Contento and Murphy (1990) conducted a retrospective study among 117 supermarket shoppers to determine whether various psychosocial factors could be used to differentiate people who reported making desirable changes in their diets from those who had not. Twelve psychosocial factors were investigated using the HBM, the behavioral intention model, and the health locus of control and self-efficacy constructs. A three part questionnaire was developed to categorize subjects, measure the twelve psychosocial variables, and to obtain demographic data. Of the 12 psychosocial variables, six represented constructs of the HBM: perceived susceptibility to diet-related diseases; severity of these diseases; benefits of taking preventive action; barriers to this action; overall health concern; and cues to action. An initial interview categorized subjects into either a "self-change" or "no change" group, depending on

reported changes in fat intake and compliance with one of the Dietary Guidelines for Americans [Guidelines] (USDA, 1985) within the past year.

Results showed significant differences between the means of self-changers and non-changers on all HBM variables except severity, and on normative beliefs, the motivation to comply with opinions of significant others, chance locus of control, and overall self-efficacy. Perceived benefits, normative beliefs, and perceived susceptibility were most predictive of change status, followed by overall health concern and chance locus of control to a lesser degree. Also, age and sex correlated with self-change and no-change variables, with older persons and females being more likely to be changers than younger subjects and males. Results demonstrated that several HBM constructs provided a large part of the explanation for why some people made dietary changes while others did not. The authors viewed the study as a useful approach for designing nutrition education and counseling programs and to study influences on dietary behavior.

While this study shows very clear support for many of the HBM constructs and other psychosocial variables, several limitations must be noted. Foremost is the use of the retrospective design, which has been consistently criticized in the HBM literature, and which was not acknowledged by the authors as a study weakness. Secondly, use of a non-random, convenience sample limits generalizability of these results, which the authors acknowledge. In addition, the rather limited demographic composition of the population (White, middle-class, educated, and suburban) does not allow for meaningful comparisons, either within the study population itself or with

more diverse populations of other studies. Thirdly, the consistency of data reported by subjects might be questionable since the initial section of the instrument was administered by personal interview in the store, and the remainder completed by subjects at home. Finally, although the study focuses on dietary behavior, the behavior is highly specific, that is, changes in fat consumption and one other recommendation from the Guidelines. The latter were not reported, which could have been valuable for identifying other variables to address in future studies.

The study possesses several strengths which have implications for this research. First, the emphasis exclusively on dietary behavior is clearly needed in the HBM literature. Also, the frame of reference for dietary behavior and information was the Guidelines. Secondly, the use of the original HBM constructs was very appropriate given limited research in the area of nutrition, and directly in line with those selected for use in this study. Also, the researchers incorporated some of the additional variables proposed for investigation (viz., health locus of control and self-efficacy). Thirdly, the development of both validity and reliability for the study instrument was extremely important, as this is a major area of weakness in HBM research.

Use of the Model for Educational Diagnosis

The HBM has largely been used to predict and explain specific behaviors in a given population. Only recently has there been a focus on use of the model as a diagnostic tool for health education programming. Three studies were identified which utilized the HBM for educational diagnosis and program development.

As part of a pretest-posttest design to evaluate a 15-hour HBM-based sex education program, Eisen and Zellman (1986) assessed pre-intervention sexual and contraceptive knowledge, attitudes toward pregnancy and contraception, and prior sexual education and sexual activity experiences in adolescents. The study was designed to program more effectively around the current level of sexuality knowledge possessed by the teenagers and to explore how this knowledge related to motivation and attitudes. The study also sought to identify how patterns of knowledge and attitudes vary with respect to gender, age and ethnicity. Two hundred and three teenagers aged 13-17, 56% of whom were either African-American or Hispanic (28% each), were recruited from various sources in the community. They were interviewed individually prior to participation in the program, at the end of the intervention, and three to six months after the program was completed.

Sexual and contraceptive knowledge was assessed in the areas of anatomy and physiology, venereal diseases, pregnancy prevention and sexuality myths, contraceptive methods and their effectiveness, and venereal disease prevention methods. Four constructs of the HBM, susceptibility, seriousness, benefits, and barriers, were the focus of the program. Instruments were developed to measure each of the study variables. These variables were selected since no previous HBM-based intervention studies had focused fertility control perceptions of adolescents.

Results of the study showed subjects to possess limited knowledge of sexuality issues prior to the intervention, with the mean percentage of correct responses on the knowledge test being 50%. The results also revealed several consistent patterns of

relationships between sexual and contraceptive knowledge, the HBM variables, and other study variables. Self-reported sexual intercourse experience and previous sex education were not predictive of any sexual or contraceptive knowledge indices, however, both were related to total knowledge scores. Age and gender significantly predicted only knowledge about birth control effectiveness. Being African-American or Hispanic was associated with significantly lower knowledge scores in all the indices except pregnancy and sexuality myths. Finally, four of the five HBM scales were significant predictors of sexual and contraceptive knowledge. Perceived seriousness was the most significant predictor of knowledge, followed by susceptibility, ideological/structural barriers, and benefits (the latter was not significant for total knowledge, however). Reporting on some of the pilot program findings, Eisen et al. (1985) found: an increase in consistent contraceptive usage; changes in HBM-based perceptions and sexual knowledge at post-testing which were predictive of increases in contraceptive usage at longer follow-up; and the majority of subjects remained abstinent from pre-intervention to follow-up. These results were less prominent among minority subjects, who had the highest rates of study attrition at follow-up.

In an attempt to address some the instrumentation problems prevalent in HBM studies, Simon & Das (1984) sought to design a measure addressing HBM dimensions that would be comprehensive enough to provide specific information for educational needs assessment for VD education. The major purposes of the study were to explore the relationship between each of four HBM dimensions and reported likelihood of taking preventive action, and to examine the individual and collective strength of the

dimensions to explain the reported likelihood of taking measures for the prevention and control of VD. Subjects comprised 416 African-American and Caribbean Black undergraduate students enrolled in fifteen classes. Classes were selected using stratified random sampling from among the seven academic divisions of the college. Almost half (46%) of the subjects were considered to be of low socioeconomic status. A valid and reliable instrument was developed to measure four constructs of the HBM, susceptibility, seriousness, barriers, and benefits, and likelihood of action. Multi-item scales were developed for each construct. Additional variables measured were frequency of asymptomatic check-ups in the past for VD and the degree of concern about contracting VD. Data were collected during classes through a single written administration.

Results indicated significant relationships between some of the HBM variables and reported likelihood of action. A strong positive relationship existed between respondents' perceptions of benefits and the likelihood of health action for the prevention and control of VD. Perceived susceptibility and barriers were modestly correlated with likelihood of action. Only perceived seriousness did not result in a statistically significant relationship to likelihood of health action. Similar results were obtained for the variable frequency of asymptomatic check-ups for VD. Relationships were found between check-ups and susceptibility, barriers, benefits, and likelihood of health action, with perceived susceptibility and barriers variables rendering the best explanation for variance in past asymptomatic check-ups. The authors conclude that this method, measuring HBM constructs using multi-item scales, yields information

on specific beliefs which can be addressed in an educational program and allows for more tailored interventions.

Manning et al. (1989) used the HBM to assess whether appropriate information about AIDS is likely to be translated into safer sexual behaviors among college students. Five HBM dimensions were explored - vulnerability (susceptibility) to AIDS, seriousness of AIDS, barriers to safer sex, helpfulness (benefits) of practicing safe sex, and likelihood of practicing safer sex. Knowledge about AIDS was also measured. Each HBM dimension was examined separately to determine where AIDS education could be most effectively targeted. The questionnaire was distributed to a convenience sample of 149 predominantly White undergraduates who sought medical attention at the student health center. Students visiting the health center for a sex-related service (such as contraceptive devices or a sexually transmitted disease) were given a different colored questionnaire and labeled as known sexually active. Remaining students were identified as perhaps sexually active.

Results indicated the students had fairly adequate AIDS knowledge, with a median score of 78%. Knowledge scores were divided into high and low categories in order to compare these with the HBM dimensions. A significant relationship was found for only one of the HBM dimensions. Low scorers perceived the barriers to practicing safer sex as being greater than did high scorers. The authors conclude that all college students need to be better informed on the facts about AIDS, since high knowledge scorers appeared to be less resistent to safe sex practices. Most

importantly, barriers to AIDS prevention need to be identified and discussed with students, especially among those with limited knowledge about AIDS.

These three studies exemplify several common factors. The HBM has tremendous potential for not only predicting and explaining specific behaviors, but also for identifying specific areas of misconception and lack of knowledge in a population which can be easily identified and targeted by the educator. Identification of existing beliefs, apart from a specific behavior, can have tremendous diagnostic value. Obviously, the key to the use of the HBM in this way rests in the development of valid and reliable HBM scales. Such scales were clearly evident in the Simon & Das and Eisen & Zellman studies, but clearly absence from the Manning et al. study. In the latter, no measures of validity or reliability were reported, nor was the nature and structure of the scales described (i.e., Likert-type, dichotomized, etc.). Also, the knowledge instrument was severely limited, both in number of items (14), structure (true/false), and content. For eleven of the fourteen questions, subjects scored 90% or above. There also was no clear explanation on characteristics of the "low scorers." This information would certainly be invaluable from a program development perspective. Conversely, the care and attention paid to psychometrics in the other two studies resulted in scales which had fairly high levels of internal consistency, although Eisen & Zellman fail to address validity of the instrument. According to Simon & Das, the key to using the HBM as a diagnostic tool rests in the development of multi-item scales for each dimension which can clearly identify specific health beliefs to be targeted in an intervention program.

Another strong element of two of the studies is the measurement of actual knowledge. While knowledge may be implied in some of the belief statements, obtaining knowledge scores more concretely identifies the specific level of knowledge of the population. Eisen & Zellman were able to report an increase in knowledge following their intervention program only because they had documented the 50% response rate in the initial knowledge test. As the beliefs that define health behavior have strong knowledge components (Rosenstock, 1966), HBM investigators should include this as a separate variable to be compared with the various HBM dimensions.

Each study also explored traditional HBM constructs, since the areas of study had not been examined extensively through the model. A major drawback, however, is that none of the studies examined either cues to action or general health motivation, both considered important variables. Given the behaviors addressed in each of these studies, an exploration of these variables could have been valuable. Finally, the focus on predominantly minority populations in the Simon & Das and Eisen & Zellman studies is very important, as these groups may possess special educational needs which must be identified.

Several weaknesses were noted, which render results from both the Eisen & Zellman and Manning et al. studies questionable. Both utilized a convenience sample, which limits generalizability of the results. Manning's arbitrary assignment of subjects into "known sexually active" and "perhaps sexuality active" groups based on the nature of the clinic visit was questionable and produced little relevant information. In the Eisen & Zellman study, students were recruited from four different sources in

a totally non-random fashion. They failed to incorporate a control group in the study, so that no true cause and effect relationship could be determined. The study also had a fairly large attrition rate by the second follow-up, making results tenuous. Another notable weakness in the Manning study is the complete failure to address the lack of significance of AIDS knowledge with the other HBM constructs which are traditionally well-supported.

Despite these weaknesses, the three studies demonstrate fairly well the effectiveness of the HBM as a diagnostic tool for needs assessment and health education program development.

Use of the Model Among Low Socioeconomic Populations of Color

Janz and Becker (1984) state that given the numerous survey-research findings on the HBM now available, it is unlikely that additional work of this type will yield important new information. While this statement may apply to the largely White, middle-class populations who have been the primary focus of HBM studies, it certainly does not hold true for poor populations of color. Some of the very early HBM studies focused on low-income or African-American populations. Many failed to identify the racial composition of the study population. Overall, however, HBM studies conducted specifically among poor persons of color are quite sparse in view of the volume of HBM studies. In Janz and Becker's review of HBM studies (1984), only eight of the 46 studies could be identified as being conducted in a low-socioeconomic or African-American population. In other studies, the percentage of

poor persons or African-Americans in the sample is so small that results obtained from them are negligible. Also, the vast majority of these studies are dated, retrospective, and utilized the HBM to examine compliance with a specific behavior. Only one sought to describe and explain specific knowledge of African-American women concerning the health behavior being explored. This study, however, did not measure traditional HBM constructs and is, therefore, not helpful for the purposes of this research (Manfredi, Warnecke, & Graham, 1977).

According to Rosenstock (1974a), the HBM would seem to have greater applicability to middle-class groups than to lower class groups since possession of the health beliefs implied in the model suggest a future-orientation, deliberate planning, and deferment of gratification in the interest of long-term goals. Hence, members of lower social classes may not be prone to accept these health beliefs. Some research suggests, however, that many do accept these beliefs, thereby indicating the ability to adopt a long-range perspective. Rosenstock emphasizes the importance of health professionals knowing that while social classes may differ in the frequency with which beliefs are held, the presence of the proper mixture of beliefs may result in the occurrence of a recommended health behavior, regardless of social class.

According to Mikhail (1981), the usefulness of the HBM is enhanced by its potential for application to a wide variety of health-related behaviors in preventive, therapeutic, and rehabilitative domains. However, more studies are needed to explore usefulness of the model for people from different age groups and different cultural backgrounds. According to Becker (1974), generalizability of the model could be

expanded by employing more extensive research of its components in different settings, with different populations, and with long-run therapies, such as diet, exercise, and smoking restriction. In addition to the Eisen & Zellman (1986) and Simon & Das (1984) studies discussed above, three recent HBM studies were identified which addressed a predominantly or exclusively African-American population.

Price et al. (1988a) conducted a study to determine knowledge and perceptions of cancer among African-American adults using the HBM. Seven hundred and sixty-nine subjects were obtained from a random selection of 11 churches out of a list of 33 large African-American churches. All adults 20 years of age and older were requested by the minister to participate in the study. Five constructs of the HBM were measured: perceived severity and susceptibility to cancer, perceived benefits of and barriers to treatment, and cues to action. Knowledge of the cancer warning signs, prevention techniques, and causes of cancer were also assessed. Readability of the survey was established at the 7th grade level.

Results of the study showed key misconceptions and lack of knowledge regarding cancer etiology, especially those related to dietary factors. Less than 40% of subjects knew that heavy alcohol consumption and a diet high in fat and poor in vitamins and minerals could be linked to cancer. Related to this was a limited knowledge of dietary factors related to the prevention of cancer. Only 61% of subjects knew that vitamin supplements did not prevent cancer, but a high fiber diet may (also 61%). Less than half identified lower alcohol consumption and maintaining normal weight as cancer prevention techniques. Only 29% of subjects were able to

identify all seven of the cancer warning signs. Twenty-percent recognized three or less, and 13% could not identify any of the signals. Regarding the HBM constructs, one in four believed it was likely that they would develop cancer sometime in life, and 42% believed African-Americans were more susceptible to cancer than Whites. Forty-one percent believed that death would result from contracting cancer. Major barriers to cancer treatment identified were cost and pain. Twenty-two percent of subjects believed that doctors fail to tell the patient the truth when they have cancer, and 20% felt hospital workers were less friendly to African-Americans than to Whites. Primary sources of cancer information were television, pamphlets, and magazines. Many of these findings were significant for age, sex, and educational level. The authors conclude that the information obtained from the study could be used to design an education intervention program to increase cancer survival among the African-American population.

The nature and results of this study are significant on a number of levels. First, the use of a fairly large, exclusively African-American population is a major strength of the study, as is the use of the church and identification of beliefs prior to program development. Second, the inclusion of the knowledge variable assists in understanding some of the beliefs expressed. Of particular interest as related to this study is the limited knowledge displayed concerning dietary factors related to cancer etiology and prevention. Third, measurement of each of the major HBM dimensions, including cues to action (but excluding motivation), is evident. Fourth, consideration

of the reading level of the population is necessary, especially when addressing health issues which contain a large amount of medical terminology.

The weaknesses of this study, however, make the results suspect. Foremost are instrumentation issues. Validity of the instrument is not established, and severely low reliabilities (less than 50%) were obtained for all but one of the HBM indices. The author justifies these based on the fact that group subscale scores were not being used. The later is another weakness, in that findings are based on individual item responses, which were simply identified by the authors as being limited in number. Also, dichotomized responses were used for most of the questionnaire items. Second, use of exclusively large African-American churches yielded a predominantly female, middle-aged, and educated population, thus, excluding low socioeconomic persons. This population could have been included had a combination of large and smaller store-front churches been targeted, as a large percentage of poor African-Americans attend these churches. Also, this fairly homogenous population precludes meaningful comparison of subgroups within the sample. Thirdly, the data were presented largely through frequency distributions and Chi-square analysis. No attempt was made to explore potential relationships between knowledge and the HBM variables.

In a similar study among 573 African-American and 291 White adolescents, Price et al. (1988b) examined perceptions of cancer in these groups to determine differences in knowledge, attitudes, and beliefs. Cancer knowledge and HBM scales similar to those discussed above were utilized. Subjects completed the questionnaire in selected classes at school on the day of administration.

Results showed several significant differences between African-Americans and Whites on cancer knowledge and HBM variables. As with the adult population above, African-American youths knew little about cancer etiology related to diet, however, they knew slightly more about these factors than White youths. African-American youths were also less likely to identify cancer prevention methods and cancer warning signs than Whites. A larger percentage of African-American subjects believed it unlikely they would develop cancer, that most people will die from cancer, and that pursuing a normal life is impossible once cancer is obtained. White youths were significantly more likely to view cancer treatment as expensive, but more African-Americans knew where to go for cancer tests. More benefits of early detection were perceived by Whites than African-Americans. The authors recommend specific cancer education interventions for youths based on these findings, noting that although significant differences existed between the two groups in beliefs about cancer, the lack of understanding was equally evident in both groups.

A great strength of this study is the use of both African-American and White subjects which allowed for more definitive comparison of knowledge and beliefs between the two groups. However, weaknesses similar to those in the adult study above were evident. The same instrument was apparently used in this study as in the above study, resulting in similar problems such as a limited number of items per HBM dimension, dichotomized responses, and no mention of validity. Reliability reported for the instrument was much higher in this study, with indices having moderate to high stability reliability, but moderate to poor internal validity. Another threat to

reliability noted by the authors was the fact that 10% of students had difficulty reading the questionnaire. Given that the original questionnaire was developed for adults, this does not appear to be a strange result. Obviously, these scales need to be revised in order to achieve a higher standard of reliability and to meet the literacy requirements of the population. Finally, unlike the study above, a convenience sample of students was used instead of a random sample, thereby, limiting the ability to generalize these findings to other adolescent populations.

A study of low socioeconomic, African-American diabetic patients by Uzoma and Feldman (1989) sought to identify the relationship of psychosocial factors on patients' adherence to an insulin regimen. Only two constructs of the HBM, perceived severity and barriers, were explored, along with self-efficacy and social support. One hundred diabetic clinic patients were systematically selected from the bottom of medical records which were ordered according to time of arrival at the clinic. Patients were interviewed while waiting to be seen by a physician.

Results showed that self-reported adherence to insulin regimen was significantly related to self-efficacy and age. Significant differences were found between males and females regarding adherence. In females, compliance was associated with self-efficacy, barriers to treatment, age, and satisfaction with support. Among males, self-efficacy, age and number of support persons were related to adherence. Self-efficacy and age best explained the variance for the entire study population and for males. Self-efficacy and satisfaction with support best explained the variance among females. The authors recommend self-efficacy training programs

tailored to gender and age, and use of social support as potential methods for addressing adherence to diabetic regimens.

This study does not represent classic HBM research, but is noteworthy due to the use of an exclusively African-American, predominately low income population. Inclusion of the self-efficacy variable is in line with current recommendations. However, social support has not been identified as a separate HBM construct. It appears that the benefits, susceptibility, and motivation dimensions, excluded from the study, would have been appropriate for investigation of this behavior. Also, the study totally lacks information regarding instrumentation, except a statement on the number of items used to measure each scale. Neither validity nor reliability of scales is reported. These omissions and weaknesses make the results and usefulness of this study questionable.

The discussion in this section clearly demonstrates a need for more accurate assessment of HBM dimensions in the areas of nutrition, educational diagnosis, and among low socioeconomic populations of color.

III. METHODOLOGICAL ISSUES REGARDING USE OF THE MODEL

While support for the HBM has been well-documented, several methodological concerns regarding its use have been repeatedly addressed in the literature. Chief among these are the use of retrospective versus prospective designs; operationalization of HBM variables across studies; selective assessment of HBM constructs; and instrumentation.

Retrospective Versus Prospective Studies

A vast number of HBM studies, especially early ones, utilized a retrospective design. In Janz and Becker's (1984) most recent review of 46 HBM studies (excluding dental health studies), 28 or 61% of the studies utilized a retrospective design. Of the 13 preventive health behavior studies reviewed between 1974 to 1984, only three or 23% were prospective studies.

According to Rosenstock (1974a), the hypothesis that behavior is determined by a particular constellation of beliefs can only be tested adequately where the beliefs are known to have existed prior to the behavior they are supposed to determine. In retrospective studies, health beliefs and behaviors are measured simultaneously, thus, assuming that the identified beliefs were existent in the population prior to the behavior being assessed. In Rosenstock's view (1974a), this is a dangerous assumption as work on cognitive dissonance suggests that the decision to accept or reject a health service may in and of itself modify individual perceptions. Results of retrospective studies may also be affected if subjects have memory problems or are unable to recall with certainty relevant aspects of their past behavior (Mikhail, 1981). The best way to counter these problems is to conduct HBM studies through a prospective design, whereby, health beliefs of the population are identified first, and behaviors measured at another point in time (Becker, 1974; Rosenstock, 1974a). Of interest in this regard are results reported by Janz and Becker (1984) in which findings from prospective studies produced significance ratios equal to or better than those

obtained from retrospective surveys. Of course, expenses incurred and time required for prospective designs make it difficult to perform HBM studies in this ideal manner.

In addition to more prospective studies is the need for more experimental designs to demonstrate true cause and effect relationships between HBM dimensions and health-related behavior (Janz & Becker, 1984). More importantly, as the HBM does not suggest a specific strategy for action, there is a need for research which attempts to enhance compliance by modifying HBM dimensions. These studies should have a prospective, field-experiment design, with attitudes and behaviors measured before and after interventions, and in both experimental and control groups. This type of research would provide the specific strategies necessary for improving acceptance of health-related recommendations, which may, in turn, reduce the potential negative effects of noncompliance on the health of the individual (Becker & Maiman, 1975).

Operationalization of Variables

A major methodological problem recognized by many HBM researchers is the various ways in which the model constructs have been operationalized. Great inconsistency exists in both how variables are termed and assessed. Variables are generally measured differently in each HBM study. In the first review of early HBM studies, Rosenstock (1974a) found that no two studies used identical questions for determining the presence or absence of each belief. This same problem was noted by Janz and Becker (1984) in their recent review of HBM studies.

Another problem related to HBM variables is the use of simple dichotomies to assess belief dimensions, even though attitudes on health-related issues are rarely an all-or-none phenomenon (Janz, 1988); or, largely open-ended questions are used (Rosenstock, 1974a). Interestingly enough, HBM studies have still been capable of predicting compliance. In spite of this latter point, standardized measurement of the variables needs to be established, including sharing of conceptual and operational definitions, so that findings may be compared across studies. There is also the need to develop more sensitive measures, using interval or ratio scales (Becker & Maiman, 1975). Such scales allow the individual to be placed on a continuum according to the strength of belief, rather than classified into only one of two groups. Continuous scales allow for differences between individuals to be assessed more adequately (Cockburn, Takey, & Sansen-Fisher, 1987).

Selection and Assessment of HBM Variables

The usefulness of the HBM in predicting and explaining behavior is also undermined when only some core dimensions are assessed (Janz, 1988). For example, although perceived barriers was the most productive dimension in Janz and Becker's review of the model (1984), it is one of the dimensions most frequently left unmeasured in empirical research. The cues to action dimension is rarely included (Rosenstock, 1974a). The motivation variable, when included, is often assessed very differently in each study, thus, yielding inconsistent findings (Mikhail, 1981).

According to Janz (1988), future research must include the development of more standardized approaches to measuring core beliefs. An example may be found through the perceived barriers dimension, which is the most poorly defined of the HBM constructs and can include any internal or external negative force working against the desired behavior. Self-efficacy fits conceptually within perceived barriers, but has not been examined in this context. According to Rosenstock, Strecher, and Becker (1988), greater advances in explanation, prediction and control may be achieved by reducing the range of this concept. By making self-efficacy explicit in the model, this would delimit the barriers dimension and offer new lines of research and practice. The demonstrated value of self-efficacy, particularly in complex behavioral changes, supports its measurement as a separate construct (Janz, 1988).

Another "problem" core belief is perceived seriousness, which consistently yields limited statistical significance, especially with preventive health behaviors (Janz & Becker, 1984). Further research is needed to determine its continued usefulness for explaining and predicting preventive health behaviors (Rosenstock, 1974a).

Instrumentation

A closely related issue to the operationalization and selection of HBM variables is that of instruments used to measure these variables. Questionnaire design has long been recognized as a major problem of HBM studies. Simon & Das (1984) noted several key instrumentation problems in HBM studies: use of extremely limited measures of each dimension; absence of actual instruments or inadequate description

of them; assessment of dimensions by only a single item or two items; limited reporting of the number of items per dimension; false projection of use of multiple items (i.e., multiple items may be used for each dimension but scored individually); lack of collective computations for each model dimension; and use of generalized versus specific health measures. Most importantly, the validity and reliability of questionnaire items are infrequently established and/or reported (Janz, 1988). According to Jette et al. (1981), the absence of reliability and validity measures limits the practical use of the theoretical formulation and reduces the potential of developing a reliable body of knowledge on which to design intervention strategies to change personal health behavior. While the ability to predict behaviors using different questions to measure the same beliefs argue for their validity, changing measures from study to study increases the danger that concepts being measured will also change (Jette et al., 1981). Green (1976) summarized this situation by describing the HBM as "the most documented set of health beliefs, but nonetheless without standardization, or tests of reliability or validity." Thus, the development of valid and reliable scales to measure HBM variables is crucial to current and future HBM research. Advances in scale development would both facilitate interpretation of study findings and allow for more comprehensive comparisons across studies (Janz, 1988).

Although a few early HBM investigators attempted to address these instrumentation issues, it has only been in recent years that instrument problems in HBM studies have been taken more seriously by researchers (Contento & Murphy, 1990; Eisen & Zellman, 1985; Simon & Das, 1984). According to this researcher's

review, ten studies between 1977 and 1989 specifically addressed the psychometrics of health beliefs. Even with this specific focus, problems yet exist concerning the nature, structure and usefulness of many of these scales. A primary problem is the fact that only three of the ten studies (Berkanovic, Telesky, & Reeder, 1981; Dielman et al., 1980; Weissfeld, Brock, Kirscht, & Hawthorne, 1987) established validity and reliability of scales on a random sampling of subjects. The remaining studies utilized various types of convenience samples. Some studies established reliability of scales but failed to address validity (Berkanovic et al., 1981; Given et al., 1983; Jette et. al., 1981; Maiman et al., 1977). The reverse was true in the case of one study (Cummings, Jette, & Rosenstock, 1978). Several studies still utilized only one or two items to measure each of the indices (Maiman et al., 1978) or two to six items (Berkanovic et al., 1981; Cockburn et al., 1987; Weissfeld et al., 1987). Two studies, although exploring health beliefs, either did not examine traditional HBM variables (Elder et al., 1985) or explored them in an unconventional way (Berkanovic et al., 1981). Weissfeld et al. (1987) did not develop an instrument, but instead extracted scale items believed to represent the HBM dimensions from a larger health survey. Only three of the studies utilized target populations which were either predominantly or partially African-American (Maiman et al., 1977; Weissfeld et al., 1987) or of low socioeconomic status (Given et al., 1983; Maiman et al., 1977). Only one study (Champion, 1984) appeared to possess all of the necessary qualities and requirements of instrument development, except for the use of a convenience sample. These issues

point to the need for further refinement of these scales, and possibly, replication of studies before the scales can be effectively used in HBM research.

Two additional weaknesses of these studies are noteworthy. None addressed the cues to action construct, an important component of the model. Also, none of the studies considered the reading level of the population when developing the scales. This is especially important regarding written health information, where there is often a mis-match between the average reading level of the general population (9th grade and below) and the average reading level of health materials (10th grade and above), including nutrition instructional materials (Doak, Doak, & Root, 1985; Nizke, 1987). This issue would be particularly important among low socioeconomic groups.

The methodological concerns expressed in this section support this study's prospective approach, use of the original HBM constructs, and development of a valid and reliable instrument, with consideration given to readability of the population.

IV. NUTRITION KNOWLEDGE, BELIEFS AND DIETARY INTAKE

Nutrition Knowledge

Knowledge is a major predisposing factor which influences health behavior. While an increase in knowledge does not always lead to behavior change, there is some association between the two variables. Health knowledge of some kind is probably necessary before personal health action will occur. The action, however, will probably not take place unless the person receives a cue strong enough to motivate him or her to act upon the knowledge he or she possesses. Knowledge, therefore, is

believed to be a necessary but not sufficient factor in changing health behavior (Green, Kreuter, Deeds, and Partridge, 1980).

Within the HBM, knowledge is considered one of the structural variables which may impact health beliefs. According to Rosenstock (1974a), cognition, along with other modifying variables, serve to condition both individual perceptions and the perceived benefits of preventive actions. Therefore, presumably, the more a person knows about and understands a particular health condition, the more likely he or she will perceive him- or herself as vulnerable to it, view the condition as serious, and identify specific benefits from following recommendations to prevent the condition.

In the area of nutrition, knowledge appears to be positively related to dietary adequacy. It also is believed to have a direct influence on attitudes toward nutrition, but a less direct impact on dietary behavior (Sims, 1976). Level of nutrition knowledge has also been correlated with age, socioeconomic status (in terms of occupation, income, and education), number of persons in the home, stage in the family life cycle, amount of weekly expenditures for food, child-rearing attitudes, food shopping knowledge, and race (Eppright, Fox, Fryer, Lamkin, and Vivian, 1970; Mann, Hildreth, Draughn, & Hegsted, 1988; Newell et al., 1985; Sims, 1976).

Several studies have investigated nutrition knowledge in various populations, usually in conjunction with attitudes and practices. These include the elderly, parents, lactating women, high school students, female athletes, educators, and navy recruits. Few of these populations, however, represent identified poor populations of color. Many studies failed to report the racial composition of their samples. A cursory

review of 25 studies which assessed nutrition knowledge between 1970 and 1989 showed that only five addressed, in part, either a low socioeconomic (Eppright, et al., 1970; Grotkowski & Sims, 1978; Mann et al., 1988) or African-American population (Conway, Hervig, & Vickers, 1989; Mann et al., 1988; Sims, 1976). Information available from these and other studies indicate that the poor and African-Americans have a lower level of knowledge concerning nutrition issues.

The FDA studies (FDA, 1974; USDHEW, 1975) showed age, educational level, Southern residency, sex, race, and socioeconomic status to be associated with lower knowledge scores and self-reported knowledge ratings. In the 1975 study, low knowledge scores were reported for: persons 50 years of age and older (44%); those with less than a high school education (75%); those living in the South (42%); males (43%); African-Americans (53%); and people of low socioeconomic status (56%). The mean knowledge score for African-Americans was 60.83 versus 70.34 for Whites and 71 for the study population (the total possible score was 134). The mean knowledge score was lowest for persons with less than a high school education (48.18), followed by those of low socioeconomic status (58.92). Each of these groups also showed the highest percentages in the low category for the self-rating of nutrition knowledge.

Grotkowski & Sims (1978) examined nutrition knowledge, attitudes, and dietary behaviors in a White, lower middle class population of 64 persons over 62 years of age who attended several senior's centers. Nutrition knowledge was assessed using a 25 item valid and reliable instrument, including a measure of self-evaluation of nutrition knowledge.

Results indicated subjects had fairly low knowledge, with a mean score of 7.2 (36%) out of a possible score of 20. The mean score on the self-evaluation of nutrition knowledge was also low, 4.8 on a scale of one to 10. Self-evaluation of nutrition knowledge and actual test scores were positively correlated. Nutrition knowledge was also significantly related to nutrition attitudes. It was highly correlated with the attitude "nutrition is important" and negatively correlated to misconceptions about weight-reducing diets and the belief that food and supplements can be used medically. Nutrition knowledge was also strongly related to socioeconomic status.

Koh and Caples (1979b) found the food selection behaviors of low-income African-American females in Mississippi to be based primarily on taste preference. Only 26% of the subjects reported selecting foods based on nutritional value in accordance with the Basic Four Food Groups. Many subjects demonstrated a lack of concern for nutrition when purchasing food. Some did indicate they knew about the importance of protein and considered it when making food purchases.

Mann et al. (1988) obtained results similar to those in the FDA studies. They examined both actual and perceived nutritional knowledge of noninstitutionalized, active elderly males and females. A non-random sample of 150 persons aged 65 years and older was selected from various older adult centers. About 36% of the population was African-American, 49% had an educational level less than high school, and 52% had a family income of less than $10,000. Data were collected through personal interviews using a 20 item instrument designed for a comprehensive study of the elderly, and consisting of a nutrition and diet section. Perceived level of nutrition

knowledge was measured by having respondents agree or disagree with the open-ended statement "I feel I know a good deal about nutrition."

Results of the study showed overall level of actual knowledge to be moderate (66% correct response). A significant difference was found between nutritional knowledge and race, with the White elderly correctly identifying a greater number of nutrition statements than the African-American elderly. There was also a significant difference between actual knowledge and level of income and education. Mean scores were significantly higher for those persons with a post-high school education than for those with a high school diploma or less. Mean scores were higher for elderly in the $25,000 to $34,000 income range than for those with income levels below $14,999. Perceived nutritional knowledge was also significantly related to race, income, and education. Elderly who were African-American, had less than a high school education, and an income level of less than $10,000 perceived themselves as less knowledgeable about nutrition than White elderly. Finally, a significant, positive relationship existed between perceived and actual nutrition knowledge, with elderly who perceived themselves to have good nutrition knowledge showing higher mean knowledge scores. These relationships were again significant for race, income, and educational level. No differences existed between the study variables and gender.

Related to lack of nutrition knowledge in general among African-Americans is an apparent limited clear understanding of relationships between diet and disease. While studies are scant in this area, available data suggest that although the American

public as a whole lacks knowledge of diet-disease relationships (Crawford, 1988), African-Americans know even less (USDHHS, 1986a).

Weaver et al. (1978) found general knowledge about cardiovascular disease (CVD) and its risk factors to be significantly different between African-Americans and Whites. Knowledge of CVD risk factors was lower for African-Americans than for Whites, especially dietary factors: obesity (32% vs. 60%), diet (25% vs. 34%), and cholesterol (17% vs. 34%). African-Americans also lagged behind Mexican-Americans in knowledge of cholesterol and obesity as risk factors. Similar results were obtained from a 1979 Louis Harris - Urban Behavioral Research Associates Survey, whereby African-Americans were less likely than whites to identify obesity, cigarette smoking, lack of exercise, fatty foods, and cholesterol as likely causes of heart trouble. They were also less likely to identify proper diet as one of the best ways to prevent heart disease (USDHHS, 1985a).

A survey of a national probability sample of 1,000 subjects conducted by the FDA and the National Heart, Lung and Blood Institute [NHLBI] assessed knowledge and beliefs about relationships between diet and CVD. Although African-Americans comprised only 9% of the sample, an examination of this subset showed they had less-than-average awareness of diet-health relationships. In particular, there was relative unawareness of the association between diet, especially fats and cholesterol, and CVDs other than hypertension. This less-than-average awareness of diet-health relationships was also most prominent among low-income respondents, the under-educated, and

those living in the South. Educational level was positively correlated with concern about fat and cholesterol consumption (USDHHS, 1986a).

Results of the two Price et al. studies (1988a, 1988b) discussed earlier clearly showed both African-American adults and youth knew little about relationships between nutrition and cancer.

The one diet-health relationship African-Americans appear to know well is the connection between sodium intake and hypertension (USDHHS, 1985a). In the FDA-NHLBI study (USDHHS, 1986a), African-Americans were more likely than Whites to emphasize dietary causes of hypertension, such as excess salt intake, consumption of fatty foods or cholesterol, and intake of pork. Most interesting is the fact that while African-Americans were more likely to indicate improper diet and overeating as likely causes of hypertension, only 17% (vs. 27% of Whites) considered being overweight as a likely cause of hypertension.

Finally, people of low socioeconomic status may be more susceptible to misinterpretation of nutrition information presented in the media. Vermeersch and Swenerton (1980) presented data from interviews of 100 EFNEP participants, which included interpretations of messages in food advertisements from certain popular magazines, understanding of selected nutrition terms from the advertisements, and personal information about the respondents. Subjects reviewed several food advertisements for both short and long sessions.

Results indicated that nutritional claims were frequently misinterpreted regardless of the length of time respondents had to study the ads. Educational level

was a significant predictor of different patterns of response. Subjects with low levels of education were especially vulnerable. Since strict regulation of the wording of nutritional claims cannot prevent all forms of deception, the authors suggest that nutrition education strategies should help consumers develop sound nutritional concepts and effective information-processing skills.

Several observations can be made from these studies. Foremost, the dearth of studies exclusively among African-Americans and the poor clearly identifies a need for baseline data on nutrition knowledge for these populations. In the FDA studies, Blacks comprised only 11% of the total study population. In the Conway et al. (1989), Mann et al. (1988), and Sims (1976) studies, African-Americans comprised 15.7%, 38.8%, and 25% of the samples, respectively. These numbers may be too small to allow for meaningful conclusions. Additionally, only the FDA and Mann et al. studies analyzed data specifically for the African-American segment of the sample. Secondly, instrumentation appears to be a major weakness of many nutrition knowledge studies. Most fail to establish validity and/or reliability of tests. Also, rarely is a core body of nutrition information identified as the source for test items. Many researchers merely state that "generally accepted" or "basic" nutrition information was used as the content base for the questionnaire, without identifying the source of this information. Or if the source is identified, consultation of that source results in similar claims. Identification of this information base is vital to both the test construction process, as well as future researchers who may wish to utilize the instrument with similar or different study populations. Thirdly, lack of random

sampling was a major problem in many of these studies. The repeated use of convenience samples seriously limits the researcher's ability to generalize information obtained from these studies.

Nutrition Beliefs

According to Green et al. (1980), a belief is a conviction that a phenomenon or object is true or real. Faith, trust, and truth are words used to express or imply belief. Some health-oriented belief statements might be: "I don't believe that medication will work"; "Exercise won't make any difference"; "When your time is up, your time is up, and there's nothing you can do about it." Beliefs, like knowledge, are one of the predisposing factors related to the motivation of an individual or group to act. These "personal preferences" are brought to an educational experience by the person or group, and may either support or inhibit health behavior. As the HBM postulates that a cue to action or precipitating force is required to propel a person into taking action, Green et al. suggest that health education could provide this cue, if the predisposing factors represented by the health beliefs are correctly identified. King (1984) states that health beliefs of the individual are not only important to the health education process, but that health education cannot be fully effective without consideration of personal attitudes.

Perceptions and beliefs of the HBM have been demonstrated to be alterable. Thus, by knowing which model components are below a level presumed necessary for compliance, the health care worker may be able to tailor an intervention to suit the

particular needs of an individual or group (Becker & Maiman, 1975). Health educators, however, need to be aware of the fact that different belief levels toward a condition exist in different population subgroups. Hence, increasing a particular belief dimension will be specific to each population. This fact argues for the value of obtaining information about the beliefs of a population prior to a health education effort (Becker, Haefner, et al., 1977).

Very little recent data exist on the nutrition beliefs of low socioeconomic African-Americans. Early studies have documented the presence of different or folk nutrition beliefs in these populations, including: fish as a brain food; limited nutritious nature of frozen foods; feeding a cold and starving a fever; removal of canned food from the can immediately after opening it; avoiding citrus fruits if one has too much acid in the blood; and getting high blood pressure from eating red meat (Cornely, Bigman, & Watts, 1963).

Nationwide FDA studies (FDA, 1974; USDHEW, 1975) of the nutrition knowledge and beliefs of food shoppers showed African-Americans (63%), people 50 years and older (59%), those living in the South (59%), low socioeconomic persons (68%), and those with low nutrition knowledge scores (65%) to be "not well-informed" about nutrition issues, based on a lower food beliefs index score.

Grotkowski & Sim's study (1978) found a strong positive relationship between adherence to food advertisements and beliefs that "foods and supplements can be used as medicine" and "misconceptions about weight-reducing diets."

Dietary Intake

Several factors act on one's food acceptance starting at birth and continue to have an impact throughout life. These factors may be intrinsic, extrinsic, personal, socioeconomic, educational, cultural, religious, regional, biological, physiological, and psychological (Khan, 1981). While African-Americans are probably more similar to Whites in dietary patterns than other U.S. minority groups, various studies have indicated major differences between the two groups in the types of foods preferred and consumed. African-Americans generally exhibit a higher preference for southern style or "soul" foods, including: various pork items, such as chitterlings, ham hocks, pig's feet and barbecued ribs; fried meats, particularly chicken and fish; collard greens, candied sweet potatoes and sweet potato pie; hominy grits; and black-eyed peas and rice (Fetzer, Solt & McKinney, 1985; Jerome, 1969; Wynant & Meiselman, 1984). In addition, they clearly show a higher preference for sweet food items (Meiselman, 1977) and salt and salt-cured foods (Kumanyika & Bonner, 1985).

Socioeconomic background is a major factor affecting food preferences, with food selection being directly related to income (Khan, 1981). In a study to investigate the frequency of food use among low-income African-Americans in southwestern Mississippi, Koh and Caples (1979a) found the mean scores for consumption of milk, vegetables, fruits, and juices to be below standard and often excluded totally from the diet. Poultry (the cheapest meat in Mississippi) was the most preferred meat, followed by pork. Inexpensive cuts of meat were primarily used. For all of the food groups, families with higher incomes and more education had better nutrition patterns than

those with lower incomes and education. Income had a greater effect on low nutrition intake than education.

Resurreccion and Pagruo (1988) studied 36 White middle income and African-American low-income mothers of preschool children to determine differences in nutrient and food consumption patterns. Low-income mothers consumed significantly more quantities than middle income mothers of refined and fried foods, liver and organ meats, sausage, luncheon meats, hot dogs, bacon, and pork fat. They also ate less vegetable oil, stewed chicken, cottage cheese, dark bread, lettuce salads, tomatoes, and vegetable casserole than middle income mothers. Perkin et al. (1988) found similar results in their investigation to examine the effect of ethnicity in determining differences in food and nutrient intake patterns between low-income African-Americans and Whites. Greater consumption of chicken, hot dogs, liver, organ meats, bacon, sausage, eggs, greens, yams, turnips, corn bread, white rice, and grits was observed among African-American women than White women. White women had higher intakes of foods like broccoli, squash, lettuce, potatoes, green beans, fresh tomatoes, apples, whole wheat bread, brown rice, cottage cheese, honey, other cheeses, wine and mixed drinks.

These clearly identified food preferences among poor African-Americans may impact their overall dietary and nutrient intake, and ultimately affect nutritional status. Obvious vitamin and mineral deficiencies have been reported among African-Americans and the poor. The Ten-State Nutrition Survey (USDHEW, 1972) was the first comprehensive attempt to assess the nutritional status of Americans, with an

emphasis on examining the nutritional status and dietary practices of low-income persons. Results of the study consistently indicated that the poorest nutrient intake and the highest prevalence of nutritional deficiencies occurred among low income African-Americans with little education. Similar results were obtained from the Health and Nutrition Education Survey (USDHEW, 1974).

Haider and Wheeler (1979) found both similarities and differences between low-income Hispanic and African-American mothers in a large urban setting. Hispanics appeared to be better fed and had more variety in their diets than African-Americans. For all the nutrients, except vitamins A and C, Hispanics had higher intakes than African-Americans. Both groups had lower intakes than the general U.S. population for all nutrients, expect protein, vitamin C, and phosphorus. The most neglected nutrients were calcium and iron, with Hispanics having a higher calcium intake. Both groups also exhibited an overall lower caloric intake, but high prevalence of obesity. Similar results were observed by Koh and Caples (1979b) in relation to a lower caloric intake, higher protein intake, and deficiencies in calcium, iron, and vitamin D. The overall lower caloric intake of African-Americans than that of Whites, in spite of the excess of obesity, appears to be a consistent finding (Perkin et al., 1988; Block et al., 1988) and may place African-Americans at particular risk for nutritional inadequacy.

Information presented in this section, as well as the extreme dearth of research in these areas, clearly indicate the need for documentation of the level of nutrition knowledge and existing nutrition beliefs among low socioeconomic African-American

populations, using valid and reliable instruments. In addition, the various factors and issues discussed throughout this section indicate a great need for relevant nutrition education among African-Americans of low socioeconomic status.

V. NUTRITION EDUCATION PROGRAMS

Nutrition education is geared towards changing attitudes (and behaviors) related to foods (Khan, 1981). However, in some instances, this education has not had a tremendous impact on the general public. Public awareness of the correlation between dietary fat and cholesterol with heart disease is fairly well established. But understanding which foods contain hidden fats and which types of fats have lower dietary risk continue to puzzle the public. Also, the relationship between diet and cancer is not that clear to the general public. These issues were confirmed through data from NHANES II which showed that on any give day: 79% of the study population eat no fruit or vegetable high in vitamin A; 72% eat no fruit or vegetable high in vitamin C; and 84% eat no high fiber cereals or breads. These results demonstrate the need to educate the American public about the life-long connection between dietary patterns and health (Crawford, 1988). Such education is sorely needed among poor populations of color, who are at greatest risk for nutritional inadequacy and the nutrition-related diseases (Harris, 1990).

Numerous studies have explored the effectiveness of specific nutrition education programs in various populations. However, as with the other study variables, few have focused on low socioeconomic groups or populations of color.

One of the most well-known community studies with a strong dietary component is the Stanford Three Community Study (Fortmann et al., 1981; Fortmann et al., 1982; Stern et al., 1976). The Stanford Study was a quasi-experimental field study to determine if a community-directed health education program would reduce the risk of CVD. The central hypothesis was that behavioral changes resulting in reduced CVD risk factors would occur if the residents of a community were educated about CVD and subsequently trained in specific skills to reduce these factors (Fortmann et al., 1982). Conducted in three northern California communities, the educational program was reported to be associated with improvement in self-reported dietary behaviors after two and three years of the intervention. Specifically, the two experimental communities showed: significant increases in knowledge of CVD risk factors; reduction in the average levels of saturated fat consumption, serum cholesterol level, cigarette smoking and systolic blood pressure; weight maintenance; and a reduction in the overall risk factor scores. A combination of health education methods were employed, including: television and radio messages, billboards, newspaper columns and advertisements, mailed printed materials, and intensive counseling and follow-up for high-risk subjects (Fortmann et al., 1981; Stern et al., 1976).

In an attempt to determine whether or not the program reached only privileged persons in the community, Fortmann et al. (1982) explored the effectiveness of the community effort in different socioeconomic and language groups in the treatment towns. Participants were divided into five SES groups: group one having the highest income and education; group 5 the least; and three language groups - Spanish-

speaking, English-speaking, and bilingual. About 8% of each treatment town and 3% of the control town was comprised of Spanish-speaking participants; bilingual subjects comprised 9.5% and 18% of the two treatment towns and 6% of the control town. Results showed that while no significant differences occurred across SES groups for any of the reported changes, the largest dietary changes appeared in the lowest SES levels. In addition, greater improvement was generally shown among bilingual and Spanish-speaking persons. The researchers concluded that a properly designed health education effort, with an emphasis on knowledge of the relationship between risk factors to basic social factors such as SES and ethnic group status, can reach high-risk, diverse populations at least as well as it can reach the majority population. A major threat to the validity of the Stanford studies is the self-report nature of the data.

Sullivan and Carter (1985) reported on the effectiveness of an 8-week nutrition and aerobic exercise program in 10 obese, low income African-American mothers of children under three years. The program was offered through a parent-child development center affiliated with the Urban League, and comprised culturally adapted exercise routines and extensive nutrition counseling. Nutrition information sessions were based on the Guidelines. Results showed no significant effect on weight loss or blood pressure, but a significant increase in resting heart rate and reduction in percentage of body fat. An analysis of subjects' food diaries showed a significant reduction in the consumption of vitamin C, protein, fat and sodium (vitamin C and protein were consumed in excess of the RDA at baseline). In addition, significant improvements were seen in the intake of calcium, iron, carbohydrate, and vitamin A,

all below the RDA at baseline. Acknowledging the small sample size as a threat to study results, the researchers concluded that this preliminary study shows the potential impact of a program to introduce women to more healthful nutrition and physical fitness concepts.

Verma, Montgomery, and Cyrus (1987) noted vast differences between the impact of cooperative extension nutrition education programs offered through the two land-grant institutions in Louisiana - one serving a predominantly White population and the other serving a predominantly African-American, low-income population. A comparison was made between extension participants and nonextension participants from the larger community. Although the programs had similar objectives, subject matter, and teaching methods, the audiences were ethnically and socioeconomically different. As a result, the institution serving the White audience showed a greater impact on program participants than the larger community by affecting both nutritional knowledge and practices. Conversely, the institution serving the African-American audience had less of an impact, with only marginal differences between program participants and non-participants in the larger community. One major reason given for this difference was cultural variation.

An interesting study by Ammerman et al. (1992) describes the impact of a physician-based model for nutrition education on CVD prevention among low income populations. Rationale for the program was based on the belief that primary care physicians may represent one of the few sources of preventive care available to the poor. However, physicians may feel unprepared to help patients achieve dietary

change. In addition, few nutrition programs focus on the special needs of low literacy populations. Thus, the *Food for Heart Program* was designed to facilitate dietary counseling by primary care physicians who serve low income patients and to overcome barriers to change experienced by patients. The three components of the program included: a validated dietary risk assessment that rapidly identified atherogenic eating habits and required limited nutritional expertise to administer or interpret; a structured diet treatment program that was culturally specific for a southern patient population and linked practical behavior change recommendations with results of the diet assessment; and a monitoring and reinforcement system that prompted physicians to review progress, reinforce prior messages, and reward positive change. Results of an evaluation of the program at eight months showed it had a positive impact on physician counseling and that patients responded favorably to the program. The authors suggest the program has broader applicability, in that nurses, health educators, nutritionists, or even lay health workers could provide the counseling rather than the physician. A five-year randomized control clinical trial of the program is currently underway to determine its effectiveness in lowering cholesterol among patients served by community and rural health centers.

Nutrition education strategies for the low socioeconomic African-American population, as with any group, need to reflect the cultural make-up of the group in order to create the greatest effect. Programs need also to aim for affective and practical learning in addition to knowledge. Participants need to identify food knowledge, beliefs and behaviors, and be encouraged to act on positive dietary and

health-related factors versus acting merely on inappropriate areas. In addition to basic nutrition, educators must uncover the specific motivations of the population prior to the development of appropriate learning opportunities. Use of direct, purposeful, (action-oriented) learning experiences versus straight, uniform-persuasion techniques are also necessary (Verma et al., 1987). In addition, the provision of nutritional information needs to be delivered through local centers and organizations operating in the area, such as churches, recreation centers, etc. Active involvement by area residents would greatly enhance nutritional efforts and status in these communities (Haider & Wheeler, 1979). Nutrition information needs to clearly reflect the socio-cultural environment as well as the literacy level of the population, as the vast majority of health and nutrition-related programs and materials have been designed for White, middle class populations (Ammerman et al., 1992). Efforts must reflect community-wide versus individualized approaches, since dietary change will only occur as individuals have the appropriate mechanisms to support change (Kumanyika & Bonner, 1987). Further, health educators must ensure that the community has the wherewithal to implement nutrition recommendations and information outlined in the nutrition program. This is particularly important for diverse populations who may experience any number of difficulties which could hinder the implementation of the recommendations, such as: transportation, lack of refrigeration, a different cultural history, lack of available nutritious food supply, and cultural, economic, and/or religious patterns and demands (Ford & Harris, 1988).

VI. THE HOUSING DEVELOPMENT AS A HEALTH RESEARCH AND PROGRAM SITE

Public housing developments represent an untapped resource in health education research and program implementation. The excess level of violence, substance abuse, gang warfare, robbery, burglary, homicide and overall depressed and dangerous conditions (Dubrow & Garbarino, 1989; Leigh & Mitchell, 1988), understandably, are in great part the reason for this. Yet, potentially some of the most needy and highest risk groups may reside in these areas.

Public housing is an important, high occupancy resource, providing homes for low- and very low-income senior citizens, disabled persons, and families with children. Over four million Americans live in public housing's 1.3 million units. Another 800,000 families have applied to live in public housing, with the average wait for an available unit being 13 months. Sixty percent of public housing households are African-American families, 24% are Hispanic and 14% are White. Forty-four percent of the population is children under 18 and 40% is between 18 to 62 years of age. Over half of households are single parent families and an additional 18% is comprised of single elderly persons. Because of these two high need groups, the principle form of income for 60% of public housing families is some form of public assistance. Twenty-five percent of families have earned income as their primary source. In 1985, the average income for all households in public housing was $6,803.05 ($5,557.27 for elderly or disabled residents), which is well below the national average family income of $25,401 (Matulef, 1987). These data clearly identify three primary groups as

potential targets for health education interventions - single mothers, children, and the elderly. For children, in particular, the housing development environment may pose a special danger. Exposure to frequent shootings, violence, gang-related activity, and other environmental dangers may place them at high risk for a wide variety of physical, social, and mental problems (Dubrow & Garbarino, 1989).

According to Freimuth & Mettger (1990), poverty, disadvantage, and disproportionate morbidity and mortality among certain groups are very real conditions. However, rather than emphasis on these characteristics, health care providers need to adopt alternative conceptualizations that may suggest non-traditional approaches to be taken in health communication campaigns. More sophisticated segmentation methods, innovative uses of mass media, and more positive conceptualizations of persons traditionally characterized by their "lack of" rather than their "wealth of" is required if health education efforts are going to impact these "hard-to-reach" audiences. In addition, the processes necessary for approaching and addressing these populations need to be fully described.

Two recent health education studies were identified which targeted a housing development population. Lacey, Tukes, Manfredi, and Warnecke (1991) used indigenous lay health educators to implement a community-based smoking cessation program in young African-American women residing in several urban public housing developments. The health workers were recruited from the population and similar to the target group in age, race, educational level, income and place of residence. They were also required to be nonsmokers. Assistance with and support for the program

were sought from the local community leadership, housing development authorities, and tenant councils. The intervention consisted of media presentations (sponsored by the National Cancer Institute) and class sessions and reminder visits conducted by the workers. Results showed that the lay health educators were highly successful in organizing this population. Over 18,000 flyers, posters, and pamphlets were distributed throughout the developments. Approximately 1,300 residents were reached through personal contact, with 639 expressing an interest in the program. Of this number, 235 individuals actually registered for the program. Eleven percent of participants in the class sessions component actually quit smoking by the end of the intervention. However, none of the participants in the reminder visits component quit. The relative success of this effort, particularly at the community level, was attributed to several factors related to the lay health educators: their knowledge of and rapport with community residents; their active presence in the community throughout the intervention; their control over key aspects of the intervention; and sponsorship by local influentials which gave them access that an outsider could not attain. The authors concluded that community-based health interventions that employ local people as lay health educators can have a positive impact on participation by populations that are generally considered difficult to reach.

Rivo et al. (1992) described the application of the Planned Approach to Community Health (PATCH), developed by the Centers for Disease Control, in an urban, African-American public housing environment. The goal of the PATCH project was to reduce chronic disease risk factors among the 7,000 residents in eight

housing developments. The three major components of the PATCH model - community mobilization, community diagnosis, and community intervention - were implemented carefully. Full participation and support was obtained from community leaders and housing development officials, including tenant council presidents. To examine the community's health problems, district-wide morbidity and mortality data were reviewed, and a community opinion and health survey was administered. Results of the health questionnaire indicated that residents of public housing were at a significantly greater risk for death from chronic diseases than their African-American counterparts in the larger community. For example, public housing women had twice the rate of obesity, three times the rate of diabetes, and twice the rate of hypertension and smoking than residents of the larger community. In addition, they did not recognize the disproportionate burden of chronic diseases in their community. They tended to rank drugs and violence as the major killers in the community, when in reality they were CVD and cancer, rated 6% and 10%, respectively, by subjects. The authors concluded that as legislative authority has been established, and more resources are being focused on implementing health interventions in public housing communities, resident-directed health programs based on a specific planning process such as PATCH may be an effective tool for improving the health of housing development residents nationally.

Dubrow and Garbarino (1989) have identified several programmatic considerations which need to be made when working with a housing development population. Service providers need to understand that the level of violent crime in the

community will impact residents' ability to participate in the various services and programs offered to them. The level of violence may also influence service providers' willingness to enter the community, as well as a program's ability to employ staff. Being cognizant of the physical space in which programs are located, the surrounding environment, and the routes to and from support services necessary for full program participation should be considered in initial planning efforts. Consultation with police and law enforcement agencies regarding actual crime rates and previous experience with crime in the communities would assist program staff in working out ways to minimize risk to participants. Lacey et al. (1991) also acknowledged the safety factor regarding door-to-door contact within high-rise public housing developments. However, they contend that community residents were able to move about without danger because of their intimate knowledge of the risks and their attachment to their neighbors. They possessed a knowledge of the community that enabled them to plan their visits to maximize their safety and knew how to avoid situations that would present potential danger. Finally, Rivo et al. (1992) acknowledged the particular barriers to methodological procedures, especially data collection, in a housing development population. These included: the difficulty of randomization of household members due to inaccurate computerized listings of residents; safety of interviewers; interviewer knowledge about the particular housing development environment; and informing the community of the survey's purpose and scheduling. Researchers working with this population should realize that these methodological concerns may require compromise on sampling procedures and acceptance of some selection bias,

as door-to-door surveys may need to be conducted during the day only on subjects who are available at the time of contact.

VII. SUMMARY

This chapter presented information on the HBM as an effective tool for studying health-related behavior. While the model has been used extensively in various areas of health, it has been limitedly applied in the area of nutrition, for educational diagnosis, and among low socioeconomic African-American populations.

Use of the HBM provides both a framework and a process for identifying, describing and explaining nutrition knowledge, beliefs and dietary intake among African-Americans of low socioeconomic status. Such an exploration is necessary since this group appears to exhibit a lower level of nutrition knowledge, different beliefs about nutrition, and higher levels of nutritional inadequacy. When nutrition knowledge, beliefs and dietary intake are adequately identified and defined, then culturally appropriate nutrition interventions can be developed to meet the particular needs of this population. The housing development setting may serve as a potentially effective site for conducting such research, in order to identify high-risk, hard-to-reach groups and to target nutrition education efforts for poor African-Americans. It may also, however, pose particular methodological and programmatic risks which could sabotage study results and intervention efforts.

CHAPTER III

METHODOLOGY

The purpose of this chapter was to outline the methods and procedures employed to achieve the purposes of this study. The following information was considered: 1) the study setting; 2) the study population; 3) selection of the sample; 4) the research design; 5) instrumentation; 6) administration of the instrument; and 7) analysis of the data.

I. THE STUDY SETTING

The area under investigation was the Mechanicsville, Lonsdale, Beaumont (MLB) section of Knoxville, Tennessee. The area comprises five census tracts: 12 and 13 (Mechanicsville), part of 14 and 28 (Lonsdale), and part of 14 and 27 (Beaumont) (United States Census, 1980). Mechanicsville is one of the oldest residential neighborhoods in the city, with two of its areas placed on the National Registry of Historic Places in 1980 (Knoxville-Knox County Metropolitan Planning Commission [KKCMPC], 1985).

According to 1986 estimates, the MLB population was 15,993. The population is 68% White, 32% African-American and 54% female. The population is relatively young, with approximately 30 percent between 18 and 34 years, and 29.3% 17 years of age or younger. About 12% percent of the population is comprised of adults 65 years and older (KKCMPC, 1986).

Poverty in the MLB area is acute. It is considered one of the poorest sections of the city, especially Mechanicsville, which is predominantly African-American (KKCMPC, 1976). Average family income ranges from a low $7,242 for some Mechanicsville residents to a high $14,170 for some Lonsdale residents. Four of the five MLB census tracts are in the top 15 census tracts in the city with the highest percentage of persons living below the poverty level. Tracts 12 and 14 represent the second (59.5%) and fourth (48.4) highest, respectively. An additional poverty indicator is the percentage of school-age children eligible for free or reduced price meals through the National School Lunch Program. Seventy-two percent to 99% of children in each of the MLB schools qualified predominately for the free meals program (Knoxville-Knox County Community Action Committee, 1985; Newman, 1983). The educational status of the community is also low. On average, only 35% of the population 25 years or older has completed high school (KKCMPC, 1986).

Although a number of social service agencies operate out of the MLB Building, health personnel and services both to and within this community are scant, including health education. The Mechanicsville Professional Center (MPC), a multi-purpose medical, dental and health services facility, was recently opened as a means for addressing the health needs of this community. The MPC represents the first of its kind in the area, and largely reflects the lone efforts of a concerned area dentist and pastor, Rev. Dr. Vincent M. Jones. Also, the Area Health Education Program of Tennessee, a federally-funded program administered by Meharry Medical College in Nashville, recently obtained a three year grant to establish an East Tennessee Area

Health Education Center. The Center, also indicative of Dr. Jones' diligent efforts, began operating in January, 1991 (C. Jackson, personal communication, May 16, 1990). These two major health initiatives offered the promise of increasing both health services and health education resources for MLB residents. They also represent potential channels for the results and recommendations of this study.

II. THE STUDY POPULATION

The population of this investigation was African-American and White females who were residents of one of four public housing developments in the MLB area. These were: College Homes and College Hills (Mechanicsville), Lonsdale Homes (Lonsdale), and Western Heights (Beaumont).

This population was selected for several reasons. Foremost, the residents represented an identifiable racially mixed, but predominately African-American, low socioeconomic group in the community. Secondly, the structure of the housing units and information available regarding them represented one of the only accurate sampling frames for low socioeconomic residents in this area. Thirdly, the combined factors of a high percentage of unemployed residents (92%), and the condensed structure of the units made this an accessible and available population within the time and resource constraints of the study. Fourthly, the large percentage of female-headed households (84%), in conjunction with the high proportion of the population under 18 years of age (49%), made this a key target population for nutrition-related research, as the female is believed to be the "gate keeper" regarding food and nutrition matters

in the home (Lewin, 1943; Schafer & Schafer, 1989). There is also evidence which suggests a positive association between dietary preferences and practices of the mother and those of her children (Birch, 1980; Pliner, 1983; Rozin, Fallon, & Mandell, 1984; Sanjur & Scoma, 1976). Finally, housing development residents are rarely targeted in health education studies.

The total population of the housing developments was 3,393 residents, with 1,721 of these (51%) adults 18 years of age or older. Average family size was 2.63, and average length of residency 8.89 years. Residents were predominately female and African-American (62% each). Forty-six percent of the population comprised adults between the ages of 18 and 61 and 49% was under age 18. Persons 62 and older constituted only five percent of the development population. Average annual family income was $4,274.00, with average project rent being $85 per month. Only eight percent of the population was employed, and 11% percent was regarded as having zero income. A breakdown of selected demographic characteristics of housing development residents is presented in Tables 1 through 4.

III. SELECTION OF THE SAMPLE

Sample selection for the study was performed through the construction of a sampling frame comprising the 1,321 inhabited units of the four housing developments. The sampling frame consisted of a list of addresses matched to corresponding unit and building numbers. A separate list existed for each development. Information used to construct the sampling frame was obtained from

Table 1

Sex and Race Characteristics of MLB Housing Development Residents

Development	Total Tenants	% Black	% White	% Male	% Female
College Hills	386	85	15	10	90
College Homes	466	94	6	16	84
Lonsdale Homes	800	83	17	10	90
Western Heights	1741	38	62	22	78
Totals	3393	2104	1287	1276	2117
		(62%)	(38%)	(38%)	(62%)

Note. From Knoxville Community Development Corporation, May 1990.

Table 2

Age Characteristics of MLB Housing Development Residents

Development	% Minors (under 18)	% Adults (18-61)	% Elderly (over 62)
College Hills	51	46	3
College Homes	42	48	11
Lonsdale Homes	52	43	5
Western Heights	48	47	5
Totals	1671	1548	173
	(49%)	(46%)	(5%)

Note. From Knoxville Community Development Corporation, May 1990.

Table 3

Family Size, Income, and Employment Characteristics of MLB Housing Development Residents

Development	Average Family Size	Average Annual Income	% Zero Income	% Employed
College Hills	2.33	3606.58	8.0	12.7
College Homes	2.95	3995.84	11.3	11.4
Lonsdale Homes	2.82	4708.45	7.9	8.4
Western Heights	2.54	4529.20	13.0	5.1
Totals	2.63	4273.85	140	256
			(11%)	(8%)

Note. From Knoxville Community Development Corporation, May 1990.

Table 4

Head of Household and Length of Residency of MLB Housing Development Residents

Development	% Single Parent Homes	% Dual Parent Homes	% Female-Headed Homes	Average Length of Residency (years)
College Hills	93	7	90	6.56
College Homes	94	6	84	13.82
Lonsdale Homes	92	8	90	11.81
Western Heights	85	15	78	6.13
Totals	1130	135	1051	8.89
	(89%)	(11%)	(84%)	

Note. From Knoxville Community Development Corporation, May 1990.

the Knoxville Community Development Corporation (KCDC) and the development office managers. Several units in College Homes and Western Heights were under remodeling construction during the time of sample selection, resulting in a substantial number of vacant units. Each development possessed some vacancies, as well as units which were used for other activities (viz. office space, maintenance, child care, or tenants council). Vacant and service units were identified for the researcher by each development manager and excluded from the sampling frame.

Sample size was determined by a formula suggested by Rubinson and Neutens (1987), whereby, proportionate random sampling in each stratum is used to determine adequate sample size. The formula considers confidence level and sampling error in calculating a representative sample size. The formula is below:

$$N = (z/e)^2(p)(1-p)$$

where N = sample size

z = the standard score corresponding to a given confidence level

e = the proportion of sampling error in a given situation

p = the estimated proportion or incidence of cases in the population

Employing the usual standard of a 95% confidence level (z = 1.96) and a sampling error of .10, a proportional stratified sample of the 1,321 units was made by taking a random sample within each housing development list using a table of random numbers. Each housing development, therefore, was sampled in the proportion that it was represented in the total housing unit population. The number of units,

proportion of the total unit population, and number of sampled units for each development are listed below:

College Hills:	140 units, 10.6% - 36 units
College Homes:	234 units, 17.8% - 56 units
Lonsdale Homes:	288 units, 21.6% - 65 units
Western Heights:	659 units, 50.0% - 96 units

The resulting sample sizes for each development would give representativeness with no more than a plus or minus .10 sampling error, with a confidence limit of 95%.

Using these methods, women from a total of 253 units were identified for participation in the study, representing a 19.2% sample of the total housing unit population and a 14.7% sample of the adult population in the developments. This was considered an adequate sample size for this small population (Gay, 1987). Individual subjects were obtained by requesting that the adult female responsible for food selection and preparation in the home participate in the study. The female was required to be at least 18 years of age.

IV. THE RESEARCH DESIGN

The research design employed in this study was adapted from that used by Champion (1984) and Simon and Das (1988). The study represents a descriptive, survey design, whereby, the current status of the population is documented with respect to one or more variables. Through the descriptive design, characteristics, attitudes, opinions, demographic information, conditions, and procedures can be

assessed. In this way, specific variables and relationships between them can be identified, and can serve as the basis for future, in-depth correlational, causal comparative, and experimental designs (Gay, 1987). The descriptive design is especially useful when examining newly identified target groups or health issues in which limited research exists. In these instances, information generated serves as a baseline for future investigations. While the survey research design has been criticized as being unworthy and a misuse of funds, it can be a powerful research tool when population selection is rigorous and well-defined, bias is controlled, and data are organized and presented systematically (Rubinson & Neutens, 1987).

In relation to examination of the HBM variables, this approach is considered acceptable, as health beliefs should be identified in a population prior to measuring behavior (Rosenstock, 1974b). While many HBM studies follow a retrospective design of identifying beliefs and behavior simultaneously, this procedure has been strongly criticized and considered a major weakness of earlier studies (Janz & Becker, 1984). Examining the HBM variables through a two phase study design has been recommended as the preferred method for exploring health beliefs as a predictor of health behavior (Becker & Maiman, 1975; Mikhail, 1981).

The major variables investigated in this study were: 1) nutrition knowledge; 2) nutrition beliefs, as expressed through the six constructs of the HBM; 3) dietary intake, as expressed through the type and amount of foods consumed and adequate consumption of the five food groups; and 4) several additional nutrition-related variables, classified as other relevant information. Also, nine major demographic

variables were explored in their relation to the above variables. These included: age, race, occupation, educational level, marital status, number of children, housing development residence, length of residency, and place of residence five years ago.

V. INSTRUMENTATION

Instruments were developed to measure subjects' responses in accordance with the overall purposes of the study. Information for instrument development was taken from various sources related to the HBM, nutrition knowledge, beliefs and dietary intake, and nutrition issues of poor women of color. Instrument design and construction were performed using the guidelines of Alreck and Settle (1985), Gronlund (1985), and Rubinson and Neutens (1987).

Several existing instruments were reviewed to ascertain their appropriateness for the study. After careful investigation of the literature and consultation with numerous nutrition education specialists, no existing instrument, in total, was found to be adequate for assessing the study variables in this population. Therefore, the researcher designed an instrument specifically for this purpose. Permission was requested and granted, where appropriate, to utilize or alter items in existing instruments deemed useful for this study.

A combined questionnaire format was considered appropriate for supplying the desired study information. The format and content for the questions were derived from three primary sources: 1) a review of HBM studies which documented use of valid and reliable scales, or utilized a largely African-American or poor population;

2) studies of nutrition knowledge, attitudes, and dietary intake among poor and African-American women; and 3) information on nutrition knowledge, attitudes and behaviors obtained by the researcher from a small group of housing development residents during preliminary observations made in the community.

The instrument was composed of four sections: a nutrition knowledge test; a scale to measure nutrition beliefs through the constructs of the HBM; a dietary intake instrument; and a section of other relevant information.

Development of the Nutrition Knowledge Test

The Nutrition Knowledge Test (NKT) was a multiple choice test developed to assess general nutrition knowledge. Items were developed from several sources: 1) review of nutrition knowledge studies which established validity and reliability of instruments and utilized a predominately poor and/or African-American population; 2) valid and reliable knowledge instruments from the Nutrition Center of the Pennsylvania State University; 3) Nutrition Achievement Tests, K - 6, from the National Dairy Council (1979); 4) the Dietary Guidelines for Americans [Guidelines] (USDA, 1985, 1990); 5) the public awareness nutrition objectives of the 1990 Objectives for the Nation [Objectives] (USDHHS, 1986b); and 6) nutrition knowledge information obtained from housing development residents during preliminary observations. The multiple choice format was chosen over the true/false format because it: effectively measures various levels of knowledge and understanding; yields greater reliability of items; alleviates response sets; is amenable to diagnosis of

incorrect information; is easier to construct; and measures the precise knowledge possessed by respondents, thus, reducing the number of guesses (Gronlund, 1985).

The general body of information used to select and develop knowledge items was the Guidelines and the Objectives. This researcher believed a more definitive body of basic or standard nutrition information was needed for the development of this test than had been used in many nutrition knowledge tests. The Guidelines and Objectives were viewed as the two primary bases of current nutrition information, education, and advice in the United States (Glanz & Damberg, 1987; Peterkin, 1985; Rose, 1992). They, therefore, could serve as the basic core concepts important for individual awareness and understanding of key nutrition issues. The scope of the test was not intended to be comprehensive of the vast spectrum of nutrition information. Rather, it reflected some of the basic or minimal information required by an individual to understand and implement the Guidelines and Objectives. This focus was also considered appropriate based on preliminary observations in the community, which indicated residents had limited or incorrect knowledge of basic nutrition issues such as cholesterol, the five food groups, caloric value of foods, vitamin supplements and requirements, food preparation methods, and weight control issues.

An initial list of 65 items was generated to assess knowledge of the principle concepts in the Guidelines and Objectives. These included: eating a variety of foods, with emphasize on the five food groups; maintaining desirable weight; lowering fat and cholesterol consumption; increasing starch and fiber consumption; reducing sodium, sugar and alcohol consumption; the major foods low in fat and sodium; the

major foods high in calories and sugar; good sources of fiber; the basic weight loss principles of eating fewer calories and increasing physical activity; and knowledge of dietary factors associated with selected nutrition-related disorders - heart disease, high blood pressure, cancer, and dental caries. Knowledge of dietary factors associated with five other diet-related disorders not included in the Objectives - stroke, diabetes, osteoporosis, cirrhosis of the liver, and obesity - were also investigated. Items requiring specific foods were selected from a list generated by Taylor (1975) in a study of food preferences, intake, and prestige of African-American women residing in the MLB area. A total score was generated by summing all the correct responses in the test. Table 5 shows the table of specifications for the NKT.

Development of the Nutrition Beliefs Scale

The Nutrition Beliefs Scale (NBS) was developed by the researcher, following methods used by Champion (1984) and Simon and Das (1984). This procedure was considered appropriate for the way in which the HBM would be tested, that is, for the purpose of educational diagnosis. The NBS was developed to measure subjects' beliefs about nutrition issues through the principle constructs of the HBM as formulated by Rosenstock (1974a) and Becker et al. (1974). These were:

1. perceived susceptibility to nutritional inadequacy and various nutrition-related disorders;
2. perceived seriousness of nutritional inadequacy and various nutrition-related disorders;

Table 5

Table of Specifications for Nutrition Knowledge Test

	Test Specifications				
Content Area	**Knows Common Terms**	**Knows Specific Facts**	**Knows Basic Concepts and Principles**	**Understands Concepts and Principles**	**Total**
Dietary Guidelines					
Eat variety	1	8		5	14
Maintain weight		1	1		2
Avoid fat and cholesterol	2		1	3	6
Adequate starch and fiber	1	1	2		4
Avoid sodium	1	1	1		3
Avoid sugar		1	1		2
Moderate alcohol			2		2
Objectives					
Foods low in fat and sodium				4	4
Foods high in calories and sugar				6	6
Good sources of fiber				1	1
Weight loss principles			3		3

Table 5 Cont.

Content Area	Test Specifications				
	Knows Common Terms	Knows Specific Facts	Knows Basic Concepts and Principles	Understands Concepts and Principles	Total
Objectives Cont. - Diet-health links					
General		2			2
Heart disease		3			3
Hypertension		1			1
Stroke		1			1
Cancer		5			5
Diabetes		1			1
Obesity		2			2
Dental caries		1			1
Osteoporosis		1			1
Cirrhosis of the liver		1			1
Total	5	30	11	19	65

3. perceived benefits of sound nutrition and nutritional practices in preventing nutritional inadequacy and nutrition-related disorders;
4. perceived barriers to and costs of developing and maintaining sound nutrition and nutritional practices;
5. cues to action for nutrition-related behavior; and
6. motivation for health matters in general.

These six variables of the HBM were considered an appropriate focus for this study because the model had rarely been used to examine nutrition beliefs specifically. As the nutrition area is explored further, other variables which have been suggested for addition to the model can also be examined.

An initial list of 150 statements was developed for the scale. The number of items for each subscale were: susceptibility - 29; severity - 24; benefits - 27; barriers - 30; cues to action - 20; and health motivation - 20. This approach was used because the development of a set of multi-item scales to measure the HBM dimensions is the key to using the model for needs assessment (Simon & Das, 1984).

Each subscale was designed using a five point Likert-summated rating scale, ranging from <u>really agree</u> (5) to <u>really disagree</u> (1). A score was generated for each subscale by summing responses. Negatively stated items were reverse scored. Hence, the higher the total score the more positive the belief for that construct.

Dietary Intake Instrument

Dietary intake was to be measured using the diet section of the Health Habits and History Questionnaire, developed by researchers from the National Cancer Institute (Block, 1989; Block et al., 1986; Smucker, Block, Cagle, Harvin, & Kessler, 1989). The diet portion of the questionnaire consisted of: 1) smoking practices; 2) vitamin and mineral supplementation; 3) special diets; 4) restaurant and fast food consumption; 5) a food frequency of 98 food items commonly consumed by the U.S. population, with an open-ended section for additional foods consumed; 6) questions on the frequency and type of fat used; 7) consumption of cereals, vegetables and fruit; and 8) weight gain or loss in the last year. The food frequency included foods representing at least 90% of the national consumption of each of 18 major nutrients, and 93% of the national caloric consumption (Block et al., 1986). The questionnaire was designed to facilitate collection of a minimum core of standardized data that would improve comparability between studies, enhance the interpretation of individual studies, and permit long-term prospective use and pooling of data. These factors were considered important in the area of diet, which may have broad applications (Block, 1989). The questionnaire was developed to be capable of either self-administration or administration by interview. A computer-assisted interview program was available, which could be modified to meet the needs of an investigator (Smucker et al., 1989).

This instrument was chosen to collect the dietary intake data because it: 1) offered a standard form for the collection of intake data; 2) is a time-limited instrument; 3) has the option for long and short versions of the diet section; 4) has the

greatest accuracy when administered by interview versus self-administration; 5) represents the usual intake of the individual; 6) allows for more accurate interpretation of associations of dietary factors with clinical signs or health outcomes; and 7) is capable of assessing both foods and food groups, current and future nutrients of interest, and the diets of a wide range of adult populations (Block, 1989).

Other Relevant Information

In addition to nutrition knowledge, beliefs, and dietary intake, several modifying variables and information considered important to the development of a sound nutrition education program in this population were also investigated. These included: 1) the prevalence of nutrition-related disorders and pregnancy in the population; 2) perceptions of personal and community health status and nutritional problems; 3) sources of nutrition information; 4) food purchasing issues; 5) participation in federal and local food assistance programs; 6) nutrition education program needs; and 7) the selected demographic variables described earlier. This information was collected through a combined open-ended and structured format to elicit data which could not be obtained through other sections of the questionnaire. Need for this type section was a major finding of the preliminary observations.

Validity and Reliability of the Instrument

Validity and reliability were established for both the NKT and the NBS. Validity and reliability of the dietary intake questionnaire had been established by the developers of that instrument (Block et al., 1986).

Face validity of the instruments was determined by the researcher as an initial screening process in item development and selection. Knowledge items were chosen and altered from existing instruments if their content correlated directly with content areas being assessed in this study. Beliefs items taken from existing scales were altered to reflect the area of nutrition, unless they could be used as written. Remaining items were developed as needed by the researcher.

Content validity of the NKT and NBS was determined by a panel of judges who assessed items for representativeness and content accuracy. Each instrument was submitted to a panel of 22 judges with expertise in one or more of the following areas: 1) measurement of nutrition knowledge, attitudes or beliefs and dietary intake; 2) nutrition education program development; 3) health education program development or research among poor populations of color; and 4) use of the HBM. The original list of judges consisted of registered dietitians, nutritionists, university professors, health educators, and advanced master's and doctoral candidates in health education and nutrition. A letter was submitted to each judge with the instrument and contained background information on the development of the scales and instructions for evaluation. The NBS included the conceptual definition of each construct to assist in the assessment process. Items in the NKT were grouped according to the Guidelines

and Objectives. Judges were asked to assess items across five categories from strongly favorable to strongly unfavorable (Rubinson & Neutens, 1987). Agreement on an item by 60% of the judges deemed it acceptable for inclusion into the final instrument (see Appendix A for judges information).

Reliability of the NKT was established by the Kuder Richardson-21 method. Reliability of the NBS was established by the Cronbach alpha coefficient.

Readability and Linguistic and Cultural Relevance of the Instrument

As very few nutrition knowledge tests and HBM scales have been designed specifically for poor populations of color, particular attention was given to issues of readability, linguistic appropriateness, and cultural relevance of the instrument for this group. Care was taken to eliminate or translate as much scientific and medical jargon as possible, while preserving the overall integrity of content information. To accomplish this, special consideration was given to construction of items using idiomatic terms and phrases commonly used by African-Americans and the poor. This was considered crucial for making the instrument linguistically and culturally relevant to the study population. Such factors are rarely considered when developing written health materials for poor populations of color, yet, they are necessary to the communication process among them. When incorporated, the target group finds these materials relevant and understandable (Parks, 1988). These issues may be especially important in questionnaire construction and the interviewing process, as poor populations of color may respond to survey questions differently based on semantic

or interpretational differences (Parks, 1984). To further aid in this regard, the instrument was reviewed by a communication expert in African-American rhetoric to determine its relevance and appropriateness for the study population.

Although the actual literacy level of the population was not determined, it could be assumed based on education data that the literacy level was low. Therefore, the instrument was developed according to principles for working with low literacy persons outlined by Doak, Doak and Root (1985). The Fry Readability Formula was used to develop the instrument at a 5th - 6th grade level of readability. According to Doak et al., the Fry method is one of the most accurate measures of readability.

The Pilot Test

The instrument was to be pilot tested on a random sample of 32 subjects from the four housing developments (8 from each development). The instrument was revised based on problems identified during administration. Special notice was taken of both verbal and non-verbal indicators that participants were having difficulty understanding or answering items. Revisions were also made in the instrument following preliminary statistical analysis of pilot test data.

The original study instrument, therefore, was designed to assess all of the study variables in a manner believed to be appropriate and valid for and relevant to the study population (see Appendix B for the original instrument).

VI. ADMINISTRATION

A letter was sent to each housing development manager and selected community leaders and organizations requesting assistance with and support for the study. Also, the study was aligned with the MPC as a means of establishing credibility of the study in the community. The instrument was administered to participants by either the researcher or one of three resident interviewers through either a personal or group interview. Guidelines for the interview technique suggested by Bailey (1982) were employed during the interviewing process. Interviewers were trained in the methods and materials of the study by the researcher.

Subjects were mailed a letter to inform them of selection for the study. The letter explained the nature and purpose of the study, importance of participation, assurance of confidentiality, estimated interview length, and how to obtain study information (Rubinson & Neutens, 1987). At the time of the interview, informed consent was obtained to acknowledge voluntary participation in the study.

The NKT was administered first, followed by the NBS, the dietary intake instrument, and relevant information section. Several aids were used to help the interview flow smoothly both for participants and interviewers. Cards and posters were developed for subjects which showed the different answer choices available for the NKT, the NBS, and the dietary intake section. These aided interviewers by limiting the need to repeat choices to subjects.

Specific questions were asked of subjects at the beginning of each section of the instrument to determine their understanding of what was required. For example,

after introducing the NBS, subjects were asked to answer the following three questions using the card or poster:

"Victor Ashe is the mayor of Knoxville, Tennessee."

"Jesse Jackson is President of the United States."

"My life is very happy right now."

These questions reflected the full range of possible responses and would clearly demonstrate subjects' ability to comprehend how they were to respond to statements. Subjects who experienced difficulty were repeatedly asked the questions until they could demonstrate competence in using the card or poster.

To help subjects complete the dietary intake section which requested portion sizes for the various foods consumed, measuring cups and spoons, and Food Model Cards created by the National Dairy Council, were used.

As a gesture of gratitude, and where needed, an incentive for participation, subjects were paid five dollars and given a readable nutrition pamphlet developed for food stamp recipients by the USDA (1979). Money was mailed in a self-addressed envelop, with an accompanying thank you letter. Parks (1984) found the distribution of one pound bags of rice for participation in a health study a welcome item in a poor, rural African-American community. Rivo et al. (1992) paid housing development subjects $5.00 for completing their health survey. Eisen and Zellman (1986) paid their predominately minority subjects a total of $20 dollars for completion of the various phases of their HBM study. Contento and Murphy (1990) gave subjects one dollar as an incentive to complete their questionnaire.

VII. ANALYSIS OF THE DATA

Data were analyzed using the Statistical Package for the Social Sciences (1983) and ABstat (1989). Data from each section were categorized and analyzed according to demographic variables, frequency distributions, and percentages. Crosstabulations were performed using the Chi square test of association to determine any differences in the population with respect to the study variables.

NKT and NBS scores were tested for relationship using the Pearson Product Moment Correlation Coefficient. Dietary intake information was to be analyzed using the software program, DIETANAL, which accompanied the instrument (Block, 1986).

VIII. SUMMARY

This chapter outlined the methods and procedures required to investigate nutrition knowledge, beliefs, and dietary intake in poor, housing development women as a basis for developing a nutrition education program for them. The study setting and population were defined. The descriptive research design was identified and associated study variables were established. A 19% sample was selected by proportionate stratified sampling of the four housing developments (253 units). Appropriate instruments were developed to measure the study variables, with particular attention given to establishing their validity, reliability and cultural relevance. The instrument was pilot tested in the study population and administered by either a personal or group interview to adult females age 18 years or older. Statistical analysis to describe and explain study variables was outlined.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this chapter was to report the processes and results of the study. The chapter addressed the following areas: 1) instrumentation; 2) administration of the instrument; 3) characteristics of the study population; 4) analysis of nutrition knowledge, nutrition beliefs and dietary intake; 5) analysis of other relevant information; and 6) summary. Particular attention is focused in each section on both obstacles encountered and methodological adjustments made throughout the study.

I. INSTRUMENTATION

Review of the Knowledge and Beliefs Instruments

Judges for Instrument Review

Table 6 shows the judges responses to the researcher's request to review the knowledge and beliefs instruments. A total of 24 (56%) professionals served as judges. Seventy-six percent (16) of the judges for the knowledge test completed the instrument. Conversely, only 36% (8) of the judges for the beliefs scale completed the instrument. Two written follow up attempts were made to request the return of both instruments. The 36% response for the beliefs scale was actually achieved as a result of the follow-up notices. While several persons indicated intention to return the beliefs scale, this never materialized. The excessive length of the scale (150 items) may have been a prohibitive factor for its completion. Those judges who did

Table 6

Judges Responses to Review Request for Nutrition Knowledge and Beliefs Instruments

	Knowledge Test		Beliefs Scale	
Request Result	**n**	**%**	**n**	**%**
Requests mailed	21	-----	22	-----
Completed reviews returned	16	76.2	8	36.4
Uncompleted reviews returned	3	14.3	4	18.2
No response	2	9.5	10	45.5
Total responses	19	90.5	12	54.5
Total requests	43			
Total responses	31	72.1		
Total completed responses	24	55.8		

complete it, however, represented persons who had either used the HBM or worked among the poor or populations of color.

Table 7 shows the composition of judges for the two instruments. Overall, judges for both instruments represented individuals with expertise in either nutrition (54%), health education (29%), the HBM (21%), health issues of the poor and POC (46%), communication (4%), or several of these areas. In addition, seven of the professionals (29%) were African-American (see Appendix B for the list of judges used to review the instruments).

Judges' Review of Instrument Items

Judges' ratings of items in the knowledge test were fairly consistent across all items (see Appendix C for the complete ratings of the NKT). Individual item ratings

Table 7

Composition of Judges for the Nutrition Instruments

Specialty Area	Knowledge Test %	Beliefs Scale %	Total %
Heath education	18.75	50.0	29.2
Nutrition	75.0	12.5	54.2
Health belief model	----	62.5	20.8
The poor or POC[a]	37.5	62.5	45.8
Communication[b]	6.25	12.5	4.2
African-American	25.0	50.0	29.1
White	75.0	50.0	70.8

Note. n = 16 for knowledge test; n = 8 for beliefs scale; n = 24 for total.

[a]POC = populations of color.

[b]The communication specialist, who was African-American, reviewed both instruments.

ranged from 31.5% to 93.7% strongly favorable (SF) or favorable (F) agreement. Forty-one (63%) of the original items on the knowledge test were rated either SF or F at or above the 60% minimum level of agreement required for an item to be deemed acceptable for inclusion into the final instrument. Seventy-eight percent of the SF or F rated items (32) were rated above the 60% minimum level.

Judges offered a wide range of comments, corrections, and recommendations regarding individual items in the test and the instrument in general. The most frequently expressed comments included: concern regarding the length of the test; need to validate the test in the study population; concept/reading level difficulty for

some items; confused wording of some items; print size; suggestions on more effective phasing of items; and various specific corrections regarding nutrition content. Two important content changes noted particularly by the nutrition specialists, of which the researcher was unaware, were: 1) a change in the four food group pattern to five food groups; and 2) a change in focus of the Guidelines from negatively worded statements to more positive statements (USDHHS, 1990). Four additional questions were offered as potential items to be included in the test, only one of which was utilized.

Judges' ratings for items in the beliefs scale were found to be even more consistent (see Appendix D for complete ratings of the NBS items). Individual item ratings ranged from 0% to 100% SF or F agreement. One hundred and fifteen (77%) of the original items on the beliefs scale were rated either SF or F at or above the 60% minimum level of agreement. Seventy-five percent of these items (86) were rated above the 60% minimum level.

There was some variation between the different subscales on level of agreement by judges. For example, the general motivation scale had the highest level of SF/F agreement for 85% of its items, followed by the barriers (83%) and cues (80%) scales. The levels of agreement were lowest for the benefits (74%), seriousness (71%), and susceptibility (52%) scales. For the motivation, barriers, and benefits scales, level of agreement for most items met or exceeded 83%. These ratings, except for the susceptibility scale, represent a fairly strong consistency between the scale items and the HBM constructs they were designed to measure. As with the knowledge test, judges for the beliefs scale offered a wide range of comments and corrections. The

most prevalent comments focused on either the need to re-word statements or the concept level and clarity of some statements.

Several critical issues arose during this review process which have major implications for the development of health education instruments and materials for low socioeconomic populations of color.

First, many judges were concerned about the population's ability to comprehend seemingly basic, but specific nutrition terminology such as cholesterol, nutrition, nutrients, cavities, diet, and carbohydrates, as well as certain diseases or health conditions. To address these concerns, particular attention was given to noting any problems subjects had with particular terms or concepts during the pilot tests.

The second issue was related to the development of cultural and linguistic relevance of the instrument. Scale items were designed to reflect not only an appropriate level of literacy, but also linguistic and cultural appropriateness for this population. To achieve this, according to V. W. Quainoo (personal communication, May 15, 1991), the communication specialist who reviewed the instrument, there was a need to "adjust" linguistic constructs within the rhetorical context or "language environment" of the population being addressed. This language environment includes all of the typical mannerisms, topics, and persons who constitute the social milieu of a person's daily linguistic potential. For the African-American, this language environment involves not only an expression which is based on the oral tradition, but also a linguistic form which emphasizes the rhythm, timing, repetition, and "sound" of words and grammatical "short-cuts." Hence, the matching of the written form to

the potential spoken form is critical not only for developing cultural and linguistic relevance of the instrument, but also to enhance understanding and to sustain the attention of the interviewee. In an attempt to meet these criteria, items were altered or written in a form which would "sound" appropriate to the target group when read aloud. Specific examples of such items in the beliefs scale are: susceptibility - 2, 4, 8, 23; seriousness - 2, 10, 13, 16; benefits - 2, 12, 16; and barriers - 15, 29, 30.

As a result of these adjustments, several interesting patterns arose regarding judgement of some items between White judges and judges who were either African-American or White but experienced in working with the poor and populations of color [other judges]. Typically, many White judges found several items "confusing," "grammatically incorrect," "poorly worded," of "poor sentence structure" or simply "didn't like the wording," even if they agreed it was an appropriate item conceptually for the instrument. Conversely, other judges rarely expressed such concerns. In addition, changes in sentence structure or specific wording suggested by White judges were often the very words or phrases which made the statement both linguistically and culturally relevant for the study population. Conversely, the same items may have been praised by other judges as a very "appropriately worded" statement or "good question" for this population. Discrepancies appeared to be most prevalent in the beliefs scale. Items which demonstrate these differences include: susceptibility -3, 4; seriousness - 2; benefits - 2, 16, 20; and barriers - 14-16, 25.

There were also differences between judges regarding inclusion of certain items which were specific problem or interest areas among African-Americans and the poor.

For example, item 63 of the knowledge test represents a major area of misinformation in the population regarding sugar as being the cause of diabetes. Yet, this item received only a 56% SF/F agreement, with most of these coming from other judges. The same was true for some of the beliefs items, especially those regarding trust in medical authorities, community programs, and nutrition information (barriers - 28-30, respectively), religious beliefs (susceptibility - 8, cues - 8) and family/friend relationships (cues - 5, 7). White judges tended to rate these items either unfavorably or undecided, or stated they were "irrelevant" to nutrition, while other judges again viewed them as important or necessary items.

Parks (1988) experienced similar problems when developing a hypertension educational pamphlet for African-Africans. White reviewers found sections of the document awkward or confusing, while both African-American lay and professional reviewers rated these as major strengths of the pamphlet for an African-American audience. On the surface, these issues appear minuscule. However, they are critical to the development of health education instruments and materials which are relevant to and understood by diverse populations. From a research perspective, such considerations are imperative to the development of instruments which effectively and accurately assess study variables and yield valid and reliable data.

According to Quainoo's in-depth review of the instruments for cultural and linguistic relevance, the following were noted as major strengths of the instruments:

1. Validation of the African-American oral-centered experience through the seeking of linguistic integrity of the instrument.

2. Use of form answers such as "don't know" in the knowledge test.

3. Cultural relevance of the menu entrees.

4. Inclusion of nutritional myths prevalent among the population in both instruments.

5. The use of short-cut wording.

Quainoo further offers the following support and insight regarding the procedures employed in the development of the instrument for this study:

> *...First, the responsibility for cultural correction in research lies primarily with the immediate researcher, that is, the individual(s) closest to the design and administration of the instrument in question. Second, the most fundamental way to secure cultural relevance involves the aspect of language and the adjustment of linguistic constructs within rhetorical contexts...There is a psychological component involved in the administering of an instrument that is tailored to the cultural needs of its population. Traditional research is most often presumptive in attempting to bring (people of color) "up-to-par" to the linguistic level of the White American middle and upper classes. Implied in the presumptive is an operationalized adaptation of racist notions about language; that the language of White Americans is the standard by which all other American language forms are measured...By adjusting the instrument to the needs and style of the population in question, the researcher is both affirming cultural uniqueness and building a psychological bridge which will most likely enhance the accuracy and thoroughness of the research.*

To address the issues outlined above for the study instruments, the researcher re-examined any items which obtained a split rating between White and other judges. If the split showed the item to be rated clearly positively by other judges and clearly negatively by White judges, then the ratings of the other judges prevailed. Recommendations for re-wording of items and sentence structure were largely based on those of other judges. Also, the researcher made judgements concerning the

retention of poorly rated items based on cultural relevance of the item, as well as specific content areas being assessed through the Guidelines and the Objectives.

From these combined evaluations and assessments, 48 of the original knowledge test items and 124 of the original beliefs scale items were retained for the pilot instrument.

The various aspects of these review procedures indicate three important principles of instrument development for low socioeconomic populations of color: 1) the need for review of potential instruments by content specialists in the health area being addressed; 2) the need to include as reviewers professionals who are either from the target group in question or very familiar with it; and 3) the need for the researcher to exercise and maintain a leadership role to ensure and preserve the integrity and purpose of the instrument for the specific population.

The Pilot Tests

The two pilot tests gave specific information on the instrument and alterations required to make it a more effective survey tool in the target population.

First Pilot Test

The initial pilot test was to be completed on 32 subjects from the study population. However, after conducting only four interviews in the population, major structural flaws were noted in every section of the instrument, except the "Other Relevant Information" section (Section IV). As a result, additional interviews were deemed fruitless, since major revisions in the instrument were required. The primary

problems noted with the original instrument were: length of administration, structure of some multiple choice items, and validity of dietary intake data generated from the Health Habits and History instrument [Health Habits].

The foremost problem with the instrument was its length. While it was anticipated that administration would be long, the exact interview length was unknown. Interview lengths for the first pilot ranged from one hour and 10 minutes to one hour and 45 minutes. In the initial review of the knowledge and beliefs instruments, an item was retained if 60% of the judges rated it either SF or F, or the researcher determined it to be culturally or content relevant. In an attempt to reduce the length of these two sections, items were reassessed based on a 70% level of agreement by judges. It was reasoned that raising the agreement level would naturally omit additional items from the instruments, while at the same time raising the agreement level of judges to a two thirds majority. In addition, another careful review of the instrument showed several redundant items. These were either omitted or combined with others to further lower the number of items in the instruments.

A second problem resulted from subjects' difficulty in processing some of the multiple choice distractors in the NKT, particularly those which contained two or more food items or concepts in one distractor (e.g., items 2-8). These lists almost invariably required multiple repeating, hence, impacting interview length. Subjects would try to keep mental or physical count (i.e., counting on fingers) of these lists of foods. Also, it appeared that some answers were given quickly or without much thought simply

because the subject could not keep track of all the foods listed. Hence, three structural changes were made in the NKT to overcome these problems:

1. All multiple choice items related to the food groups were reorganized into a separate section which contained a listing of 20 foods representing the five food groups and other foods group.
2. Multiple choice items related to foods high or low in sodium, fat, cholesterol, sugar, and calories were also reorganized into a separate section. This section comprised five sets of comparison listings of two foods, with each set possessing the stem "Which of these two foods has the most...?" For both of these sections, the lists were to be read to subjects. Correct, incorrect and don't know categories were added for interviewers to record subjects' responses.
3. All distractors for multiple choice items containing multiple food or concept listings were reduced to one food or concept per distractor.

The combined procedures of raising the level of item agreement, omitting or combining items, and altering the format of the multiple choice section effectively reduced the knowledge instrument from 48 to 30 multiple choice items and the beliefs instrument from 124 to 79 items. Knowledge test changes, however, increased the overall number of items to 75 (20 items for the food groups section; 25 items for the most foods section). From a content perspective, all of the Guidelines and Objectives were still represented, and cultural integrity was preserved.

The third problem evidenced during the first pilot test involved administration of the dietary intake section, which failed miserably. Originally, the Health Habits instrument, developed by the National Cancer Institute (NCI), was to be used to assess dietary intake. The food frequency section of 98 foods requires the recall of three specific aspects of dietary intake: 1) the specific foods consumed; 2) the specific number of times per day, week, month, or year these foods are consumed; and 3) the specific serving sizes of each food. The latter is determined by assessing one's serving size against a medium-sized serving for each food. Several aspects of this instrument proved problematic for the target population. First, some subjects had extreme difficulty identifying specifically how often foods were consumed. Even when a subject was prompted to give a specific number, answers given were often questionable, with typical responses being "as often as I can get it," "a couple times a week," or "15 times a month." A second problem in this section was length of administration. For one subject, this section alone took 35-40 minutes to complete (estimated oral administration time according to NCI is 15-20 minutes). Third, estimation of specific serving sizes for foods based on a medium-sized serving appeared quite difficult for some subjects to articulate. One subject did not complete this section out of frustration over her inability to clearly indicate both frequency and serving sizes of foods consumed. Finally, it was noted that several culturally specific foods were missing from the food frequency.

Since the basic purpose of the dietary intake section was to ascertain the nature and amounts of foods consumed by the population, a more simplified dietary intake

measure was believed to effectively yield this information. Hence, the following changes were made in the dietary intake section:

1. Most of the Health Habits instrument was deleted. The basic food frequency, five food groups subdivisions, other foods category, serving sizes concept, and selected specific questions were retained.
2. Culturally specific foods (chitterlings, pig's feet, etc.) were added from Taylor's (1975) regional food preferences list.
3. Time frames for frequency of food consumption were reorganized into a more definitive eating frequency based on a nutrition instrument developed by Story, Broussard, and Bass (1979) for Native Americans. These choice categories were: daily, 3-4 times a week, 1-2 times a week; once or twice a month, once or twice a year, never eat or don't like the food, don't know the food. These response categories would "force" subjects into a more definitive response of how often foods were consumed over the open-ended format.
4. The "Your Serving Size" section of the Health Habits instrument was restructured to read "Amount in Household Measures," also taken from the Story et al. instrument. However, the medium-sized serving as the frame of reference was retained.

These procedures were believed to be effective mechanisms for: 1) simplifying and enhancing comprehension of the instrument; 2) impacting the overall length of the instrument; 3) and ensuring more accurate reporting of data.

Second Pilot Test

The major changes required in the questionnaire, as well as the very small number of subjects interviewed in the first pilot test, obviously necessitated a second pilot test.

Table 8 lists characteristics of participants in the second pilot test. A total of 35 women from the four housing developments participated in the second pilot test, with each development equally represented. The women were largely African-American (66%), under age 34 (51%), homemakers (40%), high school educated or better (54%), and single (49%). These demographics are slightly higher for age and education than the overall population. Women who participated were those who expressed interest in the study and were available to take the survey when the interviewer was in their development. The second pilot provided additional information on the construction and administration of the instrument which needed to be considered for and implemented in the actual study.

Implementation of the changes made in the instrument from the first pilot test greatly eased administration of the survey during the second pilot, especially the knowledge and beliefs sections. However, the changes did not appear to impact interview length as expected. Interview times again ranged from one hour and 8 minutes to an hour and a half. A few subjects stopped the interview midway because they reported having to do other things.

The dietary intake section, in particular, still presented major problems. On average, this section took between 30-40 minutes to complete. Additionally, the

Table 8

Characteristics of Participants in Second Pilot Test

Demographic Variable	n	%	Cum %
Age:			
18-24	11	31.4	31.4
25-34	7	20.0	51.4
35-44	6	17.1	68.6
45-54	6	17.1	85.7
55-64	2	5.7	91.4
65 and over	2	5.7	97.1
No response	1	2.9	100.0
Race:			
African-American	23	65.7	65.7
White	12	34.3	100.0
Occupation:			
Homemaker	14	40.0	40.0
Unemployed	5	14.3	54.3
Disabled	2	5.7	60.0
Skilled laborer	2	5.7	65.7
Unskilled laborer	5	11.4	77.1
Other	2	5.7	82.9
No response	6	17.1	100.0
Education:			
0-8th Grade	2	5.7	5.7
9-11th Grade	11	31.4	37.1
Completed high school	11	31.4	68.6
Post high school education	8	22.6	91.4
No response	3	8.6	100.0

Table 8 Cont.

Demographic Variable	n	%	Cum %
Marital Status:			
Single	17	48.6	48.6
Married	4	11.4	60.0
Separated	2	5.7	65.7
Divorced	8	22.9	88.6
Widowed	3	8.6	97.1
No Response	1	2.9	100.0
Number of Children:			
1	8	22.9	22.9
2	10	28.6	51.4
3	9	25.7	77.1
4	2	5.7	82.9
5 or more	2	5.7	88.6
No response	4	11.4	100.0
Housing Development:			
College Homes	9	25.7	25.7
College Hills	8	22.9	48.6
Lonsdale Homes	9	25.7	74.3
Western Heights	9	25.7	100.0
Where Lived 5 Years Ago:			
In same development	16	45.7	45.7
In another development	2	5.7	51.4
Another part of Knoxville	3	8.6	60.0
Another part of Tennessee	2	5.7	65.7
Another state	3	8.6	74.3
No response	9	25.7	100.0
Interview Type: Personal	19	54.3	54.3
Group	16	45.7	100.0

Note. n = 35.

serving size aspect, again, proved difficult for many subjects. Attempting to determine serving size based on knowledge of a medium-sized serving may be inappropriate for this population, as many of these subjects have a limited concept of standard portion sizes of foods. While subjects could easily point to a particular measuring cup, spoon or food model to indicate serving size, this method, in the view of this researcher, probably yielded a high amount of erroneous data. This appeared to be largely due to subjects greatly underestimating portion sizes for some foods, especially gravies, fats and oils, sugar, vegetables, rice, and meats. The amount of time required to obtain this information and the potential of obtaining useless data led to the decision to delete the serving size aspect from the dietary intake section entirely. This deletion did not impact the section's ability to provide an overall picture of the type of foods consumed by the population and their frequency. It did, however, cancel the researcher's ability to perform a nutrient analysis for the various foods and generate an "intake" score for subjects.

The problems identified during the two pilot tests, especially the confirmed long length of the instrument, prompted a change in the method of administration from personal interview to group interview. These procedures are outlined in Section II "Administration of the Instrument." Overall, information from the second pilot test showed the instrument yielded the data requested fairly well. The "don't know" choice in the knowledge test proved to be quite effective. Also, use of the cards for assisting subjects with their choice selections was very helpful.

Results of Statistical Analysis of the Knowledge Test and Beliefs Scales

Knowledge Test Results

Table 9 summarizes results from the second pilot knowledge test. The overall mean score for the test was 56.4 or 75%, with scores ranging from 26 to 72. Mean scores for each section of the test was: food groups - 15.23 (76.2%); most foods - 21.51 (86%); and multiple choice - 20.2 (67.3%). The confidence band of scores, based on the standard error of measurement, was 52.81 to 59.99. The standard error of measurement lies within an acceptable range for a 75 item test (S.E. of 4 for 48-89 items (Gronlund, 1982), indicating limited variability, and hence, good test reliability.

Reliability for the test was .87, using the Kuder Richardson-21 formula. This represents a moderately high level of internal consistency and conservative estimate of reliability (Kuder-Richardson 20 = .907), as the test is measuring various traits.

Results of the item analysis showed variability between the three sections of the test on item difficulty and discriminating power, which are summarized in Table 10. Item difficulty ranged from 20% to 100%. Overall, the test was judged to be easy, with about 51% of the items falling within the very easy (90%-100%) or easy (80%- 85%) levels of difficulty. The highest percentage of both very easy (60%) and easy (40%) items was possessed by the most foods and food groups sections, respectively. Conversely, only 23% of multiple choice items were considered very easy or easy, with 53% achieving an average level of difficulty (60%-75%). Only 7% of items possessed a high level of difficulty (10%-30%).

Table 9

Test Statistics for Knowledge Test (Second Pilot)

Measure	Statistic
Number of items	75
Mean score	56.40
Median score	58.00
Standard deviation	9.80
Reliability (KR-21)	0.87
S.E. of measurement	2.99
Low score	28
High score	72

Discriminating power for items ranged from .00 (no discrimination) to .80 (moderate discrimination). Overall, the test had low power, with 59% of the items achieving a low discrimination index (.10-.40). Thirteen percent of items had no discriminating power. Discrimination was best for the multiple choice section, which had the highest percentage of items with either average or moderate power (50%). All items, except 24b in the most foods section, discriminated in a positive direction.

Regarding the effectiveness of distractors in the multiple choice section, all appeared to operate fairly well, with 47% of the items having all of the distractors selected by subjects. The majority of the distractors attracted more subjects in the lower group than the upper group. Also, the "don't know" option worked very well as a distractor among the lower group.

Table 10

Summary of Item Difficulty and Discrimination for the Knowledge Test

	Knowledge Test Section							
	FG		MF		MC		Total	
Area	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Level of Difficulty								
Very easy (90-100%)	5	25	15	60	2	7	22	29
Easy (80-85%)	8	40	3	12	5	17	16	21
Average difficulty (60-75%)	3	15	5	20	16	53	24	32
Moderate difficulty (40-55%)	2	10	2	8	4	13	8	11
Very difficult (10-30%)	2	10	---	----	3	10	5	7
Total	20	100	25	100	30	100	75	100
Power								
No discrimination (.00)	3	15	7	28	---	----	10	13
Low discrimination (.10-.40)	15	75	14	56	15	50	44	59
Average discrimination (.50-.75)	2	10	3	12	11	37	16	21
Moderate discrimination (.80-1.0)	---	----	---	----	4	13	4	5
Negative discrimination	---	----	1	4	---	----	1	1
Total	20	100	25	100	30	100	75	100

Note. FG = food groups section; MF = most foods section; MC = multiple choice section.

The following recommendations by Gronlund (1982) help explain results obtained from this analysis and should be considered when interpreting results of any item analysis data:

1. A low index of discriminating power does not necessarily indicate a defective item. If the item is examined for ambiguity, clues, poor distractors and other technical defects, and none are found, then the item should be retained if it measures an important outcome.
2. Any item which discriminates in a positive direction can contribute to the measurement of subject achievement.
3. Low discrimination indexes are often obtained for reasons other than technical defects in the items.
4. Low positive discrimination indexes are generally the rule rather than the exception in tests which measure several different types of learning outcomes, and have unequal representation of items for concept areas. Removal of these items, which generally achieve a low discrimination index, would damage the overall validity of the test in its ability to measure various outcomes.
5. Discriminating power is greatly influenced by difficulty of test items. Items at the 50% level of difficulty make maximum discrimination possible. The farther away an item moves from the 50% level, in either direction, the smaller the discrimination index. Hence, very easy items and very difficult items tend to have lower power. However, it is often

necessary to retain such items in order to measure a representative sample of concepts being addressed.

6. Item-analysis data from small samples are highly tentative. Item difficulty and discrimination are not fixed, unchanging characteristics, and will vary from one group to another. When small samples are utilized, changes in just a few subjects' responses could increase or decrease the difficulty and discrimination indexes considerably.

7. Fine distinctions among items on the basis of difficulty or discrimination should be avoided due to the tentative nature of item-analysis data. If items are discriminating in a positive direction, have effective distractors, and possess limited defects, they can be considered technically satisfactory.

8. The important question in item-analysis is not how high the discrimination index is, but instead, whether the item measures an important concept. In the final analysis, the worth of a test item is judged by logical rather than statistical considerations.

Based on these recommendations, as well as the high level of reliability, no significant changes were made in the knowledge test. It was reasoned that use of a larger sample during the actual study would produce more concrete information on item difficulty and discrimination, and would serve as the framework for making additional changes in the instrument.

Beliefs Scale Results

Table 11 summarizes results from the reliability analysis for the beliefs scale. A reliability score of .87 for the full 79 item scale was achieved using Cronbach's alpha, with the seriousness subscale having the highest reliability (.80) and the cues subscale the lowest (.35). The cues subscale was the only one which produced correlation coefficients well below the recommended .40 for all pairs with other scales. This fact, in conjunction with its very low alpha, even after deletion of items (.57), prompted removal of this scale from analysis. This reduced belief scale items to 68, and raised alpha to .89.

To further enhance internal consistency of the scales, items which demonstrated low correlations with their respective scales were deleted and consistency coefficients were recomputed. When further deletion of items decreased the alpha coefficient, the scales were considered at maximum reliability. This process resulted in a total of 51 items, with a revised overall alpha of .92. Alpha coefficients were also raised significantly for each of the subscales, except seriousness, which had only a modest increase. According to Van Halen (cited in Williams, 1979), when the reliability coefficients of a questionnaire fall within the limits of .70-1.00, the instrument would be regarded as high enough for the achievement of its specific objectives. The overall reliability of the scale, as well as the individual reliabilities of the subscales, established the NBS as internally consistent and appropriate for the assessment of nutrition beliefs in the study population. These reliabilities compare quite favorably with those found in other HBM scales, and in some instances are higher.

Table 11

Alpha Reliability Coefficients for Original and Revised Subscales of the Beliefs Instrument

	Original Scale		Revised Scale	
HBM Construct	**No. of Items**	**Alpha**	**No. of Items**	**Alpha**
Susceptibility	10	.62	8	.76
Seriousness	9	.80	8	.82
Benefits	18	.71	14	.81
Barriers	17	.75	13	.80
Motivation	14	.60	8	.70
Cues to Action	11	.35	6	.57
Total	79	.87	57	.92[a]

[a]The cues to action scale was omitted from this analysis. Number of items = 51.

According to Nunnally (1978), a coefficient of .50 is considered adequate indication of internal consistency for a questionnaire in the early stages of construction. Therefore, reconsideration was given to inclusion of the cues scale in the instrument since it was one of the original HBM constructs, and had rarely been measured. The scale was retained in the final instrument for information purposes, but excluded from analysis with the other scales. Adding the cues scale raised the total number of beliefs scale items to 57.

Development of the Final Instrument

The final instrument (see Appendix E) was properly coded for data entry and analysis. Each section was carefully re-examined for clarity and content. Structural modifications (i.e., replacement of all capitalized headings with upper and lower case words) and wording changes were made to enhance readability and comprehension for a low literacy population and to achieve consistency in phrasing (Doak et al., 1985). The instrument was restructured to facilitate the group versus personal method of administration. In addition, the following changes were made in the final instrument:

1. The demographic data sheet was placed on the first page instead of the last page. The age categories were deleted and replaced with the actual age, so that a mean age for the population could be computed. Also added to this sheet was the question: "How long have you lived here" (i.e., in the housing development)?
2. In the food groups and most foods sections, the correct/incorrect options provided limited information on subjects' actual responses. This was especially important in the food groups section, whereby subjects were identifying foods in the various food groups. Therefore, the correct and incorrect options were deleted in both sections. In the food groups section, these were replaced with a series of numbers related to each of the food groups (i.e., 1 = fruit, 2 = vegetable, 3 = meat, etc.). This way, the specific ways in which subjects might misclassify certain foods could be determined. In the most foods section, the two options

were simply labeled "1" and "2". For both sections, number 8 represented a "don't know" response.

3. Cards were developed for the choice options of both the food groups section of the knowledge test and the eating frequency to assist subjects in making their selections. These were similar to those used for the agree/disagree response choices of the beliefs scale.
4. Beliefs scale items were randomized to avoid potential response sets.
5. Minor wording and format changes were made in both the dietary intake and other relevant information sections.

The procedures employed for developing the instruments, along with the statistical analyses, confirm it as a valid and reliable tool for measuring nutrition knowledge, beliefs, and dietary intake in poor housing development women.

II. ADMINISTRATION OF THE INSTRUMENT

Training of the Interviewers

Two women were recommended to serve as resident interviewers for the study. One lived in Mechanicsville near College Homes, and the other was a former resident of College Homes. Both were well-known and respected by women and leaders in all four of the developments, and had extensive experience in working with the housing development population. In addition, they had also worked with the Census Bureau, local social service organizations, KCDC, and other departments of the University of Tennessee on various projects targeted for this population.

One interviewer was unavailable for the first training session. However, the researcher spent one half day training the other interviewer in the methods and materials of the study. This interviewer demonstrated unusually broad knowledge about the research process and approaches to working with the population. Given her background and experience, she was deemed the "head" interviewer, and given the responsibility of transmitting the training information to the absent interviewer. One week following the training, the researcher called the absent interviewer to discuss the study, the instrument and required procedures. Interviewers were given an initial packet of the study materials. With each successive change and delay in the study, the interviewers were notified and consulted.

Administration of the Pilot Tests

All interviews in the first pilot test were conducted by the researcher using the personal interview method. Interviews for the second pilot were conducted by both the researcher and the interviewers. The second pilot yielded additional information on the method of survey administration which would need to be considered and implemented during the actual study.

Initial Administration of the Second Pilot

The researcher conducted the first several pilot interviews alone by personal interview. It was decided, however, that the interviewers needed to be involved in the pilot test, especially given the length of the survey and potential complexities in administering it.

The researcher met with the interviewers to explain changes made in the instrument from the first pilot test and to alert them to problems encountered during the first round of interviewing. The interviewers then conducted three interviews each by personal interview. They then met with the researcher to discuss the process, problems experienced, the use of and recording for the instrument, and to offer recommendations for enhancement of the procedures.

Nineteen (54%) of the second pilot test interviews were conducted by personal interview. The advantages of the personal interview method, in conjunction with matching the race, ethnicity, gender and social status of the interviewer with that of the study population (Bailey, 1982; Rubinson & Neutens, 1987), would appear to make it a highly effective method of survey administration for disadvantaged groups. This method, however, may impose unique barriers when used in a housing development population. The personal interview appeared very intimidating for this group of subjects. Some appeared to be very nervous and suspicious throughout the interview. Others were very cautious about allowing entry into their homes. In addition, the actual number of available interview hours during the day for this population may be limited, due to school bus schedules, late rising, and personal safety reasons. Finally, this method may be more cumbersome for some segments of the population, especially young mothers who have several small children. Among these women, interviews were often disrupted by feedings, changings, disciplining, etc., which distracted subjects and extended interview time (see Section III "Characteristics of the Population" for expanded discussion of these issues).

Upon returning from their first round of interviews, the resident interviewers recommended that the survey be administered in groups instead of by personal interview. Several rationales for this method were offered:

1. Given the length of the questionnaire, it would be a more feasible and efficient method of administration, allowing for several people to be interviewed within the one hour plus time frame versus only one.
2. The population is accustomed to completing forms and functioning in groups (i.e., community meetings, public assistance, food dispersement).
3. It may be less intimidating than the personal interview method, and hence, yield more honest and accurate data.
4. Subjects might be more likely to attend a group meeting rather than invite the interviewer into their homes. Also, the survey could be completed at the convenience of the subjects, with fewer interruptions.
5. It would potentially result in fewer incomplete surveys.

The interviewers indicated they had employed this method when assisting other social service agencies and educational institutions working in this population. Based on these recommendations, the second half of the second pilot test interviews were conducted in a group format.

The Group Administration Method

The following procedures were employed for the administration of the survey through the group method:

1. A group of subjects were recruited to participate and met in either the home of one of the subjects or the social hall of the development. Assistance was obtained from Tenants' Association presidents in identifying interested and available women.
2. Subjects were asked at time of recruitment if they had a reading problem. If they indicated a problem, then these subjects would have the instrument administered personally.
3. The nature and purpose of the study were explained and informed consent was obtained. Subjects self-addressed the envelops for the $5.00 and were informed that the money could be mailed to an address of their choice. This option was given because two subjects during the first pilot did not want the money mailed directly to their homes.
4. The demographic information section, which was originally at the end of the survey, was completed next. Interviewers felt this information needed to be given at the beginning of the process versus the end. Thus, if someone decided to leave the group, their demographic data could still be utilized.
5. Questionnaires were distributed to subjects. Interviewers read the instructions for each section aloud and explained the various choices available. The choices were also available on both 4 x 6 cards and poster board for subjects to refer to throughout the process. For each section, examples were given to ensure subjects understood the

directions. Items in each section were read aloud by the interviewer and subjects circled and wrote their responses on the questionnaire.

6. While some interaction was allowed, specific instructions were given for limited conversation and questions during the administration of both the knowledge and beliefs sections. This was done to limit any potential influence on subjects' responses.

7. At the end of the session, interviewers reviewed each survey to ensure accuracy of completion, especially the open-ended questions in Section IV. This was performed before each subject left. If there was any missing information, subjects were asked to supply it.

There were three administrations using this format. Two groups were conducted by the interviewers, with the researcher present to observe the process. The third group was conducted by the researcher. A total of 16 (45%) of the 35 pilot subjects were interviewed by group. Of this number, 15 interviews contained complete and usable data, as opposed to 6 incomplete personal interviews. Five key observations were made regarding group administration of the survey:

1. Subjects appeared more relaxed and less "fearful" of the interview process.

2. Subjects appeared more willing to admit when they really did not know the answer to a question. A close examination of the two methods showed a slightly higher percentage of subjects in the group versus personal method circled the "don't know" option in the knowledge test.

3. Group subjects gave a wider variety of responses within the really agree-really disagree range on the beliefs scale. A comparison of the two methods showed that subjects taking the personal interview were more likely to circle either the really agree or really disagree options.
4. There did not appear to be an "influence" effect upon responses based on being in a group. This was determined both through observation of subjects during the process, who seemed to be unconcerned with the person sitting next to them when making their selections, as well as the number of "crossed out" answers on the knowledge test and beliefs scale. The latter were minimal for all three administrations.
5. Subjects appeared to enjoy being together and addressing these issues in a group, as evidenced by comments such as: "We really need this," "We all need to learn more about nutrition," "This is kind of fun," "When are we going to meet again?" and "Are we going to have these meetings on a regular basis?"

The ease of administration, potential for obtaining more accurate data, and positive responses of the subjects, lead to the decision to conduct the actual interviews in the group format. Subjects, however, who had reading difficulties or did not want to participate in a group would have the option of completing the survey personally.

Three additional procedures were added to the above process to ensure standardization and validation of procedures:

1. Administration of the instrument was limited to no more than five women per group. This would make detection of potential literacy problems easier and allow more time for checking surveys at the end of the group session. Three literacy problems were detected during the group pilot, one in each group. However, the small size of the groups allowed the interviewers to work along-side these persons.
2. In addition to the demographic data requested, address and telephone numbers were requested, to allow for validation of information from a percentage of the surveys to ensure interviewer accuracy in the selection of subjects and completion of survey forms. Subjects did not seem to mind giving this information during the group pilot.
3. It was decided to allow the interviewers to collect all of the data, since they were closest to and most trusted by the subjects.

The second pilot test demonstrated need for an additional interviewer, especially in light of the decision to allow interviewers to collect all of the data. Hence, a third interviewer was recommended and selected to assist with data collection. This person was a current, long time resident of Lonsdale Homes and past president of the Tenants' Association. She, as the other two interviewers, was very active in the development and community affairs, and was well-known and respected by residents and leaders. She was also known by the other two interviewers. The researcher trained the interviewer in the study methods and procedures, and observed her interviewing skills, which were judged as competent. She actively participated in

both methods of administration of the instrument and also offered valuable feedback regarding the processes.

Each interviewer received a standardized Interviewer's Guide, which contained all of the study instructions, procedures and materials. Also, given the limited budget for the study, interviewers agreed to payment at the rate of $4.00 per completed interview, and $3.00 for unsuccessful contacts where at least three attempts were made. They were also reimbursed for mileage.

Administration of the Actual Survey

Initial Administration Efforts

The study began in January, 1992, with data collection anticipated to take about two months, or slightly longer, pending weather conditions. Interviewers were mailed all of the study materials and called periodically (every two weeks) to identify any potential problems. Within one month of initiating the actual study, additional problems in administration were noted by the interviewers.

The foremost problem was difficulty in making contact with subjects on the randomized sample lists, even following several attempts at different times and on different days. For subjects not at home, interviewers left a note regarding a possible return date and time, and phone number to call. However, within the first two weeks of the study, interviewers were able to obtain only six interviews, largely from older adults. The second major problem encountered by the interviewers was that many women who demonstrated interest in the study often would not follow through with

either appointments for a personal interview, commitments to attend the groups, or promises to call to make an appointment. Third, there appeared to be a high "fear" factor, in that some subjects simply would not open their doors, even though they were at home. Fourth, the $5.00 did not appear to be an incentive for participation. Fifth, many women indicated they had not received the letter mailed to inform them of the study. Sixth, one development in particular was suspected to contain a heavily drug addicted population. This was indicated by either self-proclamation of subjects, neighbors' reports, or interviewer observations. For those subjects who agreed to participate, according to interviewers, the validity of the information given was questionable, especially if they were "high" when the interviewer arrived. Related to this was the report of potentially unsafe situations encountered in the homes of some of these subjects, particularly "dangerous looking" people and visible guns. Finally, there was resistance from some women about completing the survey in a group format. While they reported willingness to participate in the survey, some stated they did not want to be "bothered" with their neighbors or that they did not know other people in the development (see Section III "Characteristics of the Study Population" for further discussion of these areas).

At the same time, interviewers reported encountering several women who were not on the listing that demonstrated interest in the study. This was noted by: interviewers being questioned about the study by people standing around when a contact was attempted; women asking if they were on the list so they could participate; and requests to participate when it was learned that the contacted person

was not at home. These patterns were noted by all interviewers, who were working in two different developments simultaneously.

To overcome these problems, the following procedures were implemented:

1. Regarding inability to contact, a system of subject replacement was employed. If after two contacts (instead of three) the listed subject was either unavailable or failed to follow through with a commitment to participate, then that subject could be replaced with someone to the right or left of her unit. If no contact arose from this effort, then a replacement could be made with any interested person living in the same building. These procedures were believed to preserve some level of randomization of subjects.
2. A suspected drug addicted person was considered incompetent as a participant in the study, and a candidate for replacement.
3. To assist with groupformation, interviewers were instructed to arrange group meetings according to unit and building numbers, so that subjects could potentially meet with people they knew. Also, arrangement of groups larger than five persons was recommended to ensure that more than one or two subjects would attend a scheduled group session.

Interviewer Difficulties

The initial momentum and excitement of the interviewers waned early in the study. Within six months of initiation of the study, only 37 surveys were completed by the interviewers. Several factors probably contributed to this decline. Each had

experienced various physical (hospitalization), personal (death in family), and domestic problems during this time which prevented their consistency. Their other involvements in the community often prohibited full attention to this project. The length of the interview and processes required to obtain subjects did not match the financial rewards given. Finally, attempting to oversee interviewers long-distance probably diminished their overall effectiveness and commitment. Despite repeated requests from the researcher regarding continued participation and interest, and repeated promises from them of continued support, no additional interviews were received. The situation reached its peak when one interviewer moved to Georgia without notifying the researcher. Another began to complain about the financial arrangements stating it was not "economically feasible" for her to be involved in the study given the time requirement. The third continued to promise completion of the interviews, but failed to do so.

In light of these events, the researcher completed data collection alone. The interviewer in Lonsdale Homes did continue to collect data, but only after the researcher arrived in town. The time and financial constraints imposed by these situations necessitated two additional changes in administration: 1) to interview as large a number of women in the group format as possible; and 2) to replace sampled units after the first failed attempt with available women from the same building.

Parks (1988) experienced an almost identical situation when using resident interviewers, who were also supervised long-distance, for a health study in a poor

rural community. These problems indicate several key factors to be considered when employing residents interviewers for research projects:

1. The researcher cannot assume that a strong recommendation, good interviewing skills, initial high interest, or verbal commitment will translate into completed work from interviewers. Persistent efforts need to be made to keep them focused and progressing.
2. A consideration of other community involvements of potential interviewers should be made. Unbeknown to the researcher, two interviewers were involved in two other major projects simultaneously. These, undoubtedly, affected their involvement in this project.
3. If resident interviewers are employed, the length of time for data collection should be expanded. The many problems they face, as well as their other commitments, will invariably slow the research process.
4. The financial rewards for participation as an interviewer should match the work required. While the interviewers agreed to the financial arrangements of the study, the researcher was well aware they were not being paid at the maximum interviewer rate. A higher rate of payment may enhance interviewer performance.
5. Long-distance supervision of resident interviewers is not advisable. If there must be long-distance supervision, the hiring of a local field supervisor to whom they would report on a weekly basis is strongly recommended. This would both strengthen the visibility and

importance of the study in the minds of the interviewers and make them more accountable. The importance of this "presence" was clearly evident during the weeks the researcher was in town for data collection. The remaining interviewer called several times per week and followed through with all requests and commitments.

Final Administration Efforts

Three additional methods were employed to enhance and encourage participation in the study. First, flyers were developed to both advertise the study and remind subjects of the time and location of group meetings. A flyer was left at each home on the sampled lists whether contact was made or not. In addition, flyers were distributed to homes to the left and right of a sampled home where no contact was made. In a few instances, flyers were given to passersby or interested parties. For each person who promised participation but did not, a reminder flyer was put in their mailbox, indicating the remaining days and times for interviewing in that development. On the day prior to the last day of interviewing at each development, a "final chance" flyer was distributed again to all homes on the sampled listing. Hence, a minimum of two attempts were made to contact each person on the sampled lists. In the case of promised participation, three attempts were made. The flyers approach appeared to work well, as most participants came to the group meetings with their flyers or showed them when the researcher arrived for the personal interview.

Secondly, refreshments were used as a potential incentive for participation in the group meetings, and was advertised on the flyers. Simple snacks (punch, cookies,

cheese and graham crackers) were offered to subjects and their children during and after group sessions. This proved to be quite a welcome and refreshing treat for most subjects, especially following completion of the long survey. Many subjects were verbally very appreciative and often requested to take snacks home.

Thirdly, the researcher enlisted assistance from three development residents to make the initial contacts, distribute the flyers, and promote participation (contacters). Given the intensity of the task required in such a short time frame, the contacters were paid $50 (College Homes) and $75.00 (Western Heights). The higher payment for Western Heights was due to the massive size of this development.

Each housing development was targeted for specific interview days and times, which were noted on the flyers. A central meeting place was secured, which was either a facility on the development grounds or a resident's home. Interviewing occurred in one of three ways: 1) subjects came to the designated place for a group meeting; 2) contacters identified a group of women who were interested in having a group session in a resident's home; or 3) personal interview. Interviews took place in a variety of settings, including the porches or steps of subjects' homes. In each instance, the survey was administered as outlined in the section "The Group Administration Method."

Complications with scheduling of the social hall and concurrent activities for children in College Hills prohibited the conduct of additional interviews at this development during the researcher's visit. Also, a major shooting occurred in College Homes the week prior to data collection, making conduct of the study at this

development questionable. A decision to attempt interviews at this development was made only after careful consultation with the Tenants' Association president and local leaders, and apprehension of the suspect.

All total, 50 interviews were conducted by the researcher within a three week period and 51 by the resident interviewers within a seven month period. Sixty-two percent of the interviews were conducted by group. Twenty groups were conducted, with average group size being three women and a range of two to seven women.

Average interview length for all interviews was approximately 92 minutes, with a range of 49 to 165 minutes. Personal interviews, on average, took slightly less time than group interviews (84 minutes vs. 90 minutes, respectively). However, a smaller percentage of group interviews were over the 92 minutes average than personal interviews (40% vs. 61%, respectively). Interview lengths generally exceeded the 90 minutes average because the subject either was elderly, had a reading problem, or experienced repeated interruptions during the interview process.

The researcher clearly experienced all of the same problems as did the interviewers (i.e., inability to contact, lack of follow through, poor group attendance, and no receipt of introductory letter). The instrument was often administered under less than desirable conditions, such as insect-infested homes, unsanitary and noisy environs, and limited privacy. In addition, other factors were noted as potential problems of working with this population, namely, timing of public assistance checks and food stamps distribution, size of the facility, the availability of a central meeting

place, and limited hours available for interviewing. These issues are discussed in further detail in the section " Characteristics of the Study Population."

Overall, the procedures employed for administration of the study instrument clearly indicate this to be a hard-to-reach population. All of these procedures, adjustments and incentives resulted in only 101 interviews, most of which were from persons who were not on the original sample listing. The implications for lack of representativeness of the sample and its impact on study results may suggest that another research methodology might be more applicable for a housing development population. On the other hand, observers of the process and leaders in the community found it both remarkable and commendable that 101 women from this population were willing to participate in the study. From this perspective, the study may have planted a "seed" for raising awareness of and interest in nutrition and other health issues.

III. CHARACTERISTICS OF THE STUDY POPULATION

Contact Information

Table 12 summarizes the contact, interview and response rates for the study population by housing development. These rates were calculated using the following formulas:

Contact Rate:	number of contacts/number of eligibles
Interview Rate:	number of interviews/number of contacts
Response Rate:	number of interviews/number of eligibles

Table 12

Contact, Interview and Response Rates for the Study Population

	Rates[a]					
	CR		IR		RR	
Development	**n**	**%**	**n**	**%**	**n**	**%**
College Homes	20	35.7	4	20.0	4	7.1
College Hills	30	83.3	12	40.0	12	33.3
Lonsdale Homes	54	83.1	16	29.6	16	24.6
Western Heights	40	41.7	10	25.0	10	10.4
Total	144	56.9	42	33.3	42	16.6

Note. Based on sampled units only and does not include additional contacts.

[a]CR = contact rate; IR = interview rate; RR = response rate.

Table 13 summarizes results of contact efforts in the population. These results show a major problem regarding recruitment of sampled subjects for the study, with inability to contact sampled subjects and failure of subjects to follow through with participation being the foremost problems. The sample population consisted of 253 randomly selected housing development units. A contact was considered complete if the interviewer actually interacted with someone at the sampled unit. This included all promises of participation, a male-only home, an incapacitated subject, and refusals. Based on this information, the contact rate for the sample listing was only 56.9% (144 contacts). Approximately 30% of the sample (76 units) could not be contacted, usually due to either not being at home or failure to open the door when at home.

Table 13

Results of Contact Efforts in Study Population

	Development[a]									
	CHM		CHL		LH		WH		Total	
Contact Characteristic	**n (56)**	**%**	**n (36)**	**%**	**n (65)**	**%**	**n (96)**	**%**	**n (253)**	**%**
For Sampled Units										
Promised participation[b]	12	21.4	26	72.2	38	58.5	31	32.3	107	42.3
Unable to contact[c]	32	57.1	4	11.1	8	12.3	32	33.3	85	30.0
Vacant	4	7.1	2	5.6	1	1.5	23	24.0	30	11.9
Incapacitated contact	2	3.6	1	2.8	1	1.5	3	3.1	7	2.8
Male-only home	0	0	0	0	2	3.1	3	3.1	5	1.9
Refusal	6	10.7	3	8.3	13	20.0	3	3.1	25	9.9
Other reason for no contact[d]	0	0	0	0	2	3.1	1	1.0	3	1.2
For Additional Contacts										
No. additional contacts	7	-----	13	-----	10	-----	37	-----	67	-----
Promised participation	7	100	13	100	10	100	32	86.5	62	92.5

Table 13 Cont.

	Development[a]									
	CHM		CHL		LH		WH		Total	
Contact Characteristic	**n (56)**	**%**	**n (36)**	**%**	**n (65)**	**%**	**n (96)**	**%**	**n (253)**	**%**
Contacts Summary										
Total contacts	27	-----	43	-----	64	-----	77	-----	211	-----
Contacts from sample list	20	35.7	30	83.3	54	83.1	40	41.7	144	56.9
Actual participation[e] from sample list	4	7.1	12	33.3	16	24.6	10	10.4	42	16.7
Additional contacts	7	-----	13	-----	10	-----	37	-----	67	-----
Actual participation from additional contacts	7	100	13	100	10	100	28	75.7	58	86.6
Total Interviews for all Contacts	11	40.7	25	58.1	26	56.5	38	49.7	100	47.4
Percentage of Original Sample	----	19.6	----	69.4	----	40.0	----	39.5	----	39.5

[a]CMH = College Homes; CHL = College Hills; LH = Lonsdale Homes; WH = Western Heights.

[b]Promised participation = a verbal commitment by the subject to participate in either the group or personal interview.

[c]After at least two, and in some instances three, attempted contacts.

[d]One address could not be found; one was an office building; one an interviewer never contacted.

[e]Actual participation = subject followed through with commitment to participate.

Regarding the latter, subjects would often either peer out of the window or door to view who it was and simply not respond, or remove flyers or reminder notes from the mailbox once the interviewer left the premises. Also, for many subjects, the sound of either the television or radio or an ajar inner door were often indications that the subject was at home but simply not responding. All interviewers reported this problem. Contact rates were best for College Hills and Lonsdale Homes (both 83%) and worst for College Homes (36%). The former may be related to the extreme familiarity of the interviewers with residents at these developments. Also, College Hills is a relatively small development, and two interviewers worked there together. The shooting at College Homes may have made it less likely that subjects would allow a "stranger" entry into their homes, and probably explains why this development had the lowest percentage of completed interviews (19.6%). Western Heights is a massive development (close to 700 units), at which the researcher worked alone with assistance from the two contacters. Given the size of this development, more than three attempts per unit over a longer period of time was required to make contact with all sampled subjects. In addition, a development of this size would require several interviewers and contacters to target its various sections.

An additional 12% of the units on the sampled listing were vacant. This was particularly a problem at Western Heights, whose vacancy rate was 24%. Upon receiving the unit listing from KCDC, each housing development manager was asked to identify both vacant units and other buildings (offices, social hall, etc.) which would need to be removed from the listing. This procedure was again performed at the time

of study implementation. However, major remodeling activities coincided directly with final data collection, with several of the sample units being affected.

Another issue which may have affected the contact rate was the fact that only 26% of participants reported having received the introductory letter for the study. Upon traveling throughout the developments, the reason for this became apparent. During initial visits to the developments, the researcher observed that actual unit numbers were in reverse order on the KCDC list used as the sampling frame. This was taken into consideration when the sample was drawn and letters mailed. What was not known, however, was the fact that this reverse ordering was not uniform for all buildings. Thus, the unit numbers were reversed in some buildings and not in others. Since the letters were simply mailed to "The Lady of the House" by unit number, it was highly likely that many subjects were never informed about the nature, purpose and procedures of the study. As a result, they may have been unprepared to receive the interviewer.

A very interesting and totally unexpected phenomenon occurred regarding additional contacts for the study. A total of 67 contacts were made with women who were not on the sample listing. These women had learned about the study either by word-of-mouth, the flyers, or by observing the interviewers' attempts to make contact with sampled subjects. Among these women, approximately 93% (62) promised to participate in the study, and 87% (58) actually did participate. Conversely, 74% of women contacted from the sample list agreed to participate, but only 39% followed through with this commitment. As a result, these additional women comprised 58%

of the subjects interviewed for the study. The reason for this divergent participation was not fully understood. While failure of the introductory letter may partially account for this phenomenon, it does not explain it fully, as all sampled women were given either flyers or reminder notes, and had opportunities to call to learn more about the study. Hence, even without the letter, they were equally or more informed about the study than the other women. Perhaps these additional women represented the more highly motivated and interested women in the community, who were willing to either initiate a participation request or respond to requests made.

The interview rate for the sampled population was 33%, with College Hills having the highest rate (40%). Interview rate for the additional contacts was 87%. The overall response rate for the sample population was about 17%. When combined with interviews achieved from additional contacts, the response rate for the original target of 253 units was only 39.5% The response rate for all contacts was 47.4%

The low contact, interview, and response rates, as well as the large percentage of participants coming from outside the sample listing, clearly designate this a nonrepresentative sample of the study population. Therefore, any results and conclusions drawn from it must be interpreted with extreme caution.

Demographic Characteristics

Table 14 shows the major demographic characteristics for the study population. A total of 101 women participated in the study. However, the results of one subject

Table 14

Characteristics of the Study Population

Demographic Variable	n	%	Cum %
Age:			
18-24	20	20.0	20.0
25-35	29	29.0	49.0
36-45	23	23.0	72.0
46-59	14	14.0	86.0
60 and over	10	10.0	96.0
No response	4	4.0	100.0
Race:			
African-American	81	81.0	81.0
White	16	16.0	97.0
Other	3	3.0	100.0
Occupation:			
Homemaker	43	43.0	43.0
Unemployed	20	20.0	63.0
Disabled	6	6.0	69.0
Skilled laborer	4	4.0	73.0
Unskilled laborer	10	10.0	83.0
Other	3	3.0	86.0
No response	14	14.0	100.0
Education:			
0-8th Grade	11	11.0	11.0
9-11th Grade	30	30.0	41.0
Completed high school	45	45.0	86.0
Post high school education	11	11.0	97.0
No response/Don't know	3	3.0	100.0

Table 14 Cont.

Demographic Variable	n	%	Cum %
Marital Status:			
Single	52	52.0	52.0
Married	11	11.0	63.0
Separated	9	9.0	72.0
Divorced	19	19.0	91.0
Widowed	9	9.0	100.0
Number of Children:			
0	4	4.0	4.0
1	20	20.0	20.0
2	29	29.0	49.0
3	19	19.0	68.0
4	11	11.0	79.0
5 or more	13	13.0	92.0
No response	8	8.0	100.0
Housing Development:			
College Homes	11	11.0	11.0
College Hills	25	25.0	36.0
Lonsdale Homes	26	26.0	62.0
Western Heights	38	38.0	100.0
Length of Residency:			
Less than 1 year	13	13.0	13.0
1-5 years	34	34.0	47.0
6-10 years	12	12.0	59.0
11-15 years	10	10.0	69.0
16-20 years	7	7.0	76.0
21-30 years	11	11.0	87.0
More than 30 years	8	8.0	95.0
No response	5	5.0	100.0

Table 14 Cont.

Demographic Variable	n	%	Cum %
Where Lived 5 Years Ago:			
In same development	51	51.0	51.0
In another development	12	12.0	63.0
Another part of Knoxville	20	20.0	83.0
Another part of Tennessee	9	9.0	92.0
Another state	8	8.0	100.0
Received Survey Letter:			
Yes	26	26.0	26.0
No	74	74.0	100.0
Interview Type:			
Personal	38	38.0	38.0
Group	62	62.0	100.0

Note. n = 100.

were excluded, as she was deemed mentally incompetent halfway through the interview process.

Subjects were predominately African American (81%) with a mean age of 37.6 years and range of 18 to 83 years. The population was relatively young, with 72% between the ages of 18 to 45. Forty-three percent of the women indicated their occupation as homemaker and 20% reported being unemployed. Forty-one percent of the population had less than a high school education. The highest grade level completed ranged from fifth grade to four years of college or post-high school training, with a mean education of 11 years. The interesting finding of women reporting a post-high school education (11%), usually college, was also noted in the

pilot study population, but at a higher percentage (23%). Many of these women stated they were only living in the developments until they "got on their feet." The predominant marital status reported was single (52%), followed by divorced (19%) and married (11%). The mean number of children was 2.97, with a range of 0 to 14.

Length of residency in the various housing developments showed some interesting patterns. Lengths ranged from one month to 51 years, with a mean residency of 11.2 years. Twenty-six percent of subjects had lived in the developments for more than 15 years. The longest mean residency was reported by subjects living in Lonsdale Homes (18.7 years) and shortest for College Hills (6.4 years). Many women indicated being "second generation" development residents. As might be expected, older subjects (55 years and over) showed a longer mean residency (26.1 years) than younger (18 to 34 years) subjects (6.3 years). However, 24% of subjects who reported living in the development 20 years or more where between 24 and 40 years of age. Mean stay for these women was an astounding 31.4 years, indicating some had lived in the development most or all of their lives. This mean stay actually equalled that of women 55 and over who reported living in the development 20 years or more (32.2 years). Sixty-three percent of the women reported living in a housing development five years ago, with 53% of these being the same development. The mean stay for women who reported living in the same development 5 years ago was 18.9 years. Twenty percent had lived in another part of Knoxville and 17% either in another part of Tennessee or another state (nine and eight percent, respectively). These data suggest that the housing development population is fairly stable, with little

movement out of the development as one ages. From conversations with some women, continued residency in the developments was based on economic constraints (the inexpensive rent mostly), displacement from other housing, or strong familial ties, all factors noted by (Matulef, 1987). Other women possessed a perception that they were being "made" to say in the developments, as expressed by one 21-year resident: "You know they make us live here. So, what can we do?"

These data compare favorably with data received from KCDC and the second pilot population described in Tables 1 through 4 and Table 8, respectively. They conflict, however, with regard to the percentage of African-Americans, elderly, high school graduates and post-high school training, and mean residency.

The demographic variables were either dichotomously or trichotomously subdivided, where necessary, to perform crosstabulations. Crosstabulations of the demographic variables showed some associations between them. Due to the disproportionate representation of African Americans to Whites, race was excluded from these analyses, as fair and accurate racial comparisons could not be made. Table 15 summarizes the crosstabulations between the demographic variables.

Most associations were related to age. Age was highly associated with level of education ($p = .0004$), marital status ($p = .001$), number of children ($p = .0005$), and length of residency ($p = .0000$). Age was also associated with where the subject lived five years ago ($p = .013$). All associations occurred in the expected direction (i.e., a higher percentage of younger versus older women were high school graduates, single or married vs. divorced or widowed, had fewer children, and a shorter length

Table 15

Crosstabulations Between Demographic Variables

	Demographic Variable						
	Age	Occupation	Education	Marital Status	# of Children	Housing Development	Length of Residency
Demographic Variable	Chi-Square Value						
Age	-----	-----	-----	-----	-----	-----	-----
Occupation	1.72	-----	-----	-----	-----	-----	-----
Education	15.66***	6.08	-----	-----	-----	-----	-----
Marital status	25.74***	20.77**	11.19	-----	-----	-----	-----
Number of children	20.12***	8.12	5.09	17.46*	-----	-----	-----
Housing development	8.35	11.83	5.35	9.72	5.12	-----	-----
Length of residency	32.75***	3.89	10.14*	13.41	7.50	17.10**	-----
Where lived 5 years ago	19.42*	5.58	14.45	21.71	8.28	7.72	41.67***

Note. n and *df* vary for each crosstabulation.

*$p < .05$. **$p < .01$. ***$p < .005$.

of residency). Regarding location of residency five years ago, women over 30 (77%) were more likely to have lived in the same development than women under 30. However, women under 30 (83%) were more likely to have lived in another development. They also had higher percentages for living in other places, especially another part of Tennessee (50%) and another state (57%).

Occupation was highly associated with marital status ($p = .008$), with a significantly higher percentage of single women reporting being unemployed (48%) than other women. Marital status was also associated with number of children ($p = .025$). Single women were more likely to have fewer than five children. Divorced and widowed women showed the highest percentages for five or more children (39% and 23%, respectively).

In addition to age, length of residency was strongly associated with housing development location ($p = .009$) and where the subject lived five years ago ($p = .0000$). As described above, Lonsdale Homes subjects showed the highest percentage of 20 years or more residents (58%). Western Heights subjects had the highest percentage of subjects who lived in the development 10 years or less (42%); as opposed to College Hills subjects who reported a lower mean residency. Women who lived in a location other than the same development substantially fell into the 10 years or less category. Those who lived in the same development were fairly uniform across all length of residency categories.

One of the most interesting associations was between length of residency and educational level ($p = .038$). It might be expected, based on the previous discussion,

that better educated women would have a higher percentage in the 10 years or less category and a lower percentage in the 20 years or more category. This was not the case, however. Although better educated women did comprise the highest percentage of subjects residing in the developments for 10 years or less (67%), they also showed the highest percentage of residents living in the developments for more than 20 years (44%) (vs. 28% each for subjects with an 8th grade or less or 9th to 11th grade education). In addition, 41% of 11 to 20 year residents were better educated women. These data suggest that in spite of the women's expectations and perceptions, they are not "getting out" of the development, and are, in fact, more likely to stay than women with less than a high school education. This interesting finding definitely requires further exploration.

The final association was between housing development and receipt of the introductory letter ($p = .00003$). Sixty-two percent of subjects who reported receiving the introductory letter resided in Lonsdale Homes. Interestingly, the unit reversal pattern was more uniform at this development. Similarly, the development with the most confusing and inconsistent reversal pattern, Western Heights, showed the highest percentage of subjects reporting no receipt of the letter (46%).

These findings indicate the housing development population to be similar, in most respects, to other low socioeconomic populations. However, these residents may also possess unique attributes, especially related to age, educational level, and length of residency in the development, which would need to be considered carefully during program development and implementation. In addition, variations between housing

developments within the same locale need to be explored, to identify potential barriers which may hinder or even abort research efforts in this population.

Other Characteristics

The contact and administration procedures employed in this study indicated several potential difficulties in working with a housing development population: 1) inability to make contact with sampled subjects; 2) lack of follow through by interested subjects; 3) high mistrust and fear of "outsiders"; 4) a potentially large drug-addicted population; 5) interruptions in the interview process, especially among women with very young or several children; 6) a large percentage of vacant units; and 7) a limited number of actual interview hours.

The very high level of inconsistency among subjects, especially given the high level of interest expressed in the study and nutrition issues, proved to be the most frustrating and baffling part of the process. Surprisingly, the actual refusal rate among contacted subjects was only seven percent. While a high level of potential mistrust was expected, the excessive inconsistency was not anticipated. Lacey et al. (1991) reported a similar pattern in their smoking cessation program targeted for African-American females in a housing development population. Although lay health educators distributed over 17,000 flyers, posters, and pamphlets, they were able to make face-to-face contact with only 1,300 people. Of this number, 49% expressed interest in the program and pre-registered for it. Upon recontact for the program, however, 63% of initially interested contacts refused or were unable to participate in

the program. Of the remaining 235 persons who registered for the program, only 60% actually followed through with participation. The 235 registered persons represented about a 16% response to the program, which is about the same rate of response to this study. Also like this study, Lacey et al. reported only a 5% refusal rate among all persons contacted.

Several factors may explain this conflicting phenomenon of high interest accompanied by high inconsistency for this study population:

1. The time constraint of interviewing subjects prior to 5:00 p.m. While on two occasions the researcher conducted interviewers past 6:00 p.m., generally all interviews were conducted by no later than 5:00 p.m. This was recommended by both workers in the area and residents themselves. The other exception was the interviewer living in Lonsdale Homes, who conducted a large percentage of her interviews in the evening. As much of the drug-trafficking occurs during the evening hours, it may be unsafe for an "outsider" to be in the area at night. Also, there was apparently a higher than expected percentage of the population that was employed. Thus, inability to offer evening interviewing options may have prohibited participation by some subjects.

2. The "stories hours." Many subjects who indicated an interest in the study were disappointed to learn that group meetings were scheduled during the time of their favorite soap operas. Several personal

interviews were arranged by subjects for after 4:00 "when my stories go off." Also, the problem mentioned previously, of individuals being at home but not opening their doors, may be related to this issue. While this may appear to be a minute, and even humorous, factor, it may need consideration when establishing a contact and interview schedule for this population.

3. Limited early morning interviews. Interviews were rarely conducted prior to 11:00 a.m. Of the 49 interviews conducted by the researcher, only two were scheduled by subjects for 9:00 a.m. Of the three morning interview sessions scheduled at Western Heights on 3 different days, only one subject attended.

4. School bus schedules. Mothers of young school age children may be prohibited from participating during the times when they are transporting children to and from bus stations, usually at the noon hour. If there are older children, then the 3:00 hour may be a poor time as well. Several of these women expressed interest in the study, but were understandably preoccupied with the busing issue.

5. Total limited interviewing time. Given the four time-related factors mentioned above, the potential total available interview time for this population may be between 11:00 a.m.-1:00 p.m. and 4:00-6:00 p.m. Exceptions would depend on whether or not interviewers actually live

in the developments and feel comfortable about conducting evening interviews, or the use of more money or incentives.

6. Public assistance check and food stamp distribution. During the periods when public assistance checks and food stamps were being distributed by mail (the first and second weeks of the month, respectively), it was virtually impossible to obtain subjects for the study. During these times, residents were often either waiting at home for disbursements or doing their monthly shopping. Comments such as "I don't want to miss the mailman" or "If the mailman comes, I'll have to stop" were common. A very high level of anxiety was also noted during these periods. These disbursement periods need to be clearly identified prior to implementation of research methods. Given the strong likelihood that subjects would be at home during this time, these weeks could be devoted strictly to making the initial contacts with subjects.

7. The method of administration of the $5.00. Originally, the $5.00 was to be distributed by giving subjects a voucher to be redeemed for money at the MPC. However, while the MPC would have been an ideal disbursement location for College Homes and College Hills residents, it would have inconvenienced subjects living in Lonsdale Homes and Western Heights. Thus, it was decided to mail the money instead. This method, however, may have reduced the effectiveness of the money as an incentive for participation in the study. Also, the

amount may have been prohibitive, although most subjects appeared very grateful for it. A survey of this length probably would merit payment at the rate of $20.00. An efficient mechanism for distributing the money on the day the survey is completed, without interviewers having to carry it around, may enhance the process and encourage consistency. For example, the voucher system described above might be very effective if payments could be distributed through a local agency or even the rental office. The decision to mail the money versus disbursing it on-site was confirmed to be appropriate, as the researcher was approached a few times by males who wanted to know if she was "the lady giving out $5.00."

8. Location of the meetings. At the two smaller developments, College Homes and Hills, participants had to walk very short distances to the meeting site for the group interviews. However, both Lonsdale and Western Heights were larger, and required a longer walk to meeting sites. In addition, Western Heights, unlike the other three developments, surprisingly lacked a central meeting place (i.e., Tenants' Association building or social hall). Therefore, meetings were held at one of the local agencies operating out of the development. While this was very convenient for subjects in the immediate area, it may have been a barrier for subjects on the opposite end of the development. As a matter of fact, all interviews on the far end of the development were

conducted in a resident's home. Many of these women indicated they were unwilling to walk up or down "the hill" to get to the established meeting site. Others said they did not know the location. A central meeting place or persons willing to hold meetings in their homes are key factors in the group administration interview method.

9. Overall fear, mistrust, and lack of understanding of the research process. Some women asked extensive questions about the nature of the study, who would get the information, and why it was being done in the developments. Results of the non-respondents follow-up (see below) showed that some women failed to participant due to misunderstanding of the project. Hence, even with making a verbal commitment to participate, subjects possibly may not have fully understood the nature and purpose of the study. The failure of the mailed letter, as mentioned earlier, may have also facilitated this.

Overall, this population may be described as "typical" of many disadvantaged populations, with some perspectives and pressures which may be unique to living in a housing development. The excessive poverty was evident in the condition of many homes and the environment in general, although some homes and properties were very well kept. In spite of the high educational levels reported, low literacy was quite evident, as many subjects did not know how to address an envelop, or had difficulty completing the open-ended questions in Section IV. Massive spelling and grammatical errors were also noted in this section. Another interesting observation was the very

high level of miscegenation between African-Americans and Whites. Under these circumstances, many Whites were more closely aligned with African-Americans, in mannerisms, speech patterns, thought processes, and some food preferences.

Many subjects exhibited great interest in both the study and other health issues in the community. Three repeatedly expressed concerns were for substance abuse, teen pregnancy, and lack of parental care for and supervision of children. Many middle age and older women expressed great concern for the welfare of young children, especially in the area of nutrition, who were under the guidance of either relatively young or drug-addicted mothers. Women also often expressed being fearful or mistrustful of their neighbors, and disappointment over the lack of community cohesiveness. The former was often given as the reason for choosing the personal versus the group interview. Another observation, which lends insight into the "mind set" of this population, is the fact that they often spoke of the community or neighbors as "they" or "them," and usually very negatively. Many women viewed themselves quite differently from other development residents. Several stated that while they lived there, they definitely "were not like the rest of the people" that live in the development. This attitude came through clearly in the open-ended questions in Section IV.

Subjects, for the most part, did not seem to mind the long length of the survey, especially those interviewed in the group setting. While a few subjects hissed and sighed during its administration, most found it both interesting and helpful. Five subjects requested the results of their knowledge test. The sampling of subjects'

comments below give additional insight regarding this population and their thoughts about participation in the study:

"I don't know the answer, but I want to take a guess (or at least try it)."

"We ain't doin' nothin' else; we can take the time to do this." (regarding the length of the survey)

"We really need a lot of help here."

"I would like to learn more about nutrition because of my kidney failure." (the subject was on dialysis)

"This is something we all need to know."

"This was a lot of fun."

"What is wrong with these people that they won't come out to do the survey, since it will help them?"

"It's about time somebody is taking an interest in how these people eat out here."

"I'll be glad when they start something out here for these people to do."

"I might as well tell you the truth."

"I really like this survey. You can really learn from it."

"Thank you for coming (taking the time) to talk to us."

Negative comments expressed included: "They need to pay us more than $5.00 to take this long test"; "Some of these questions are a trip/crazy"; "Who wrote these dumb questions?"; and "These questions get too personal."

In addition to responding to the nutrition survey, conversations with subjects generally proceeded to other topics of interest. For example, after one group interview in a resident's home, the group of six women requested advice and guidance from the researcher regarding the "proper procedures" for filing an official complaint to housing development authorities for management's failure to address a sanitation problem for over four years. Other subjects wanted to discuss special issues or concerns related to their families or the community-at-large, or inquired about how the researcher learned to do surveys. Some subjects offered specific comments or requests regarding the process or health in general, including: pleas to return to help them establish both nutrition and other health programs; the need to address all health issues; and the need for "more people like you" to work among them. In general, many subjects appeared both awed and appreciative that someone was willing to "come to them" to solicit their opinions. Two interactions with subjects were particularly gratifying experiences for the researcher. One involved a comment made by a subject who was seen the day after her interview. She stated: "I loved what I experienced here yesterday. I hope this will really help the community." The other involved the oldest subject interviewed (83 years), who came to the group interview with her original letter (mailed in December, 1991) and stated "I saved this and have been waiting for you to come; and now you're finally here." The fact that the researcher was African-American seemed to play a major role in subjects' willingness to discuss health and other issues.

Another indication of interest in health issues was evidenced through a recycling survey and recruitment program which was being conducted at the same time as this study. Several residents had committed to participate in the program, as evidenced by the large number of recycling bins located outside of their homes. Also, unexpected interactions occurred with men either on the sample list or in the community at large, who were very disappointed that they were excluded from the study. Comments from these men included: "I'm in charge of nutrition at my house. So why can't I participate?", "Don't you care about the men?", "How come you all are always taking to the women and not the men?"

These comments and observations suggest this population has an interest in health issues. While possibly lacking motivation, knowledge, and certain skills, there does appear to be a genuine concern for matters of health. Potential programs in this population need to identify these concerns and devise strategies which are matched specifically to them. It is also imperative that the various factors and issues described throughout this section be addressed when targeting the housing development population for health education research and program efforts. Finally, given some of the unique features and requirements of this population, other measures of "success" of an effort may need to be derived.

Non-Respondents Follow-up

A follow-up survey was conducted to determine potential differences between the study subjects and non-participants. A 20% sample of non-participating units from

the original sample listing for each development was randomly selected for the follow-up. A total of 41 units were selected in the following compositions for each development: College Homes and College Hills - 10 units each; Lonsdale Homes -9 units; and Western Heights - 12 units. The demographic information sheet from the study was mailed to each unit, with a letter explaining its purpose. In addition to the demographic information, a section on participation information was added, whereby the woman was simply asked to check all of the reasons why she did not participate in the study. Since low socioeconomic populations are known to not respond well to mailed surveys, two dollars cash was included with the request.

A total of 16 women (39%) responded to the survey within one month of its mailing. Also three (7.3%) were returned by the postal service indicating the units to be vacant. The level of response was actually surprising, given the poor response rate for the overall study. In addition, the researcher mailed at the same time a follow-up letter and survey to women interviewed by the resident interviewers, in an attempt to validate their surveys. No money was included, however, since they had already been paid $5.00 for participation. Within the same one month time period, only two of these surveys were returned. Thus, the two dollars probably encouraged the women to return the follow-up surveys promptly.

Table 16 compares the major demographic variables of the study population with those of non-respondents. Crosstabulations were performed on all variables in the same manner as for the study population. Significant differences were found for only three of the variables - occupation, housing development, and receipt of the study

Table 16

Comparison of Major Demographic Data Between Respondents and Non-Respondents

Demographic Variable	% NR	% R	χ^{2a}
Age			.540
Mean age	44.5	37.9	
Age range	20-89	18-83	
Race			.018
African-American	75	81	
White	19	16	
Occupation			7.94*
Homemaker	13	43	
Unemployed	31	26	
Employed	43	17	
Education			.099
Mean education level (years)	10.8	11.0	
High school graduates/Post high school	63	56	
Grade range	3-14	0-16	
Marital Status - Single	50	52	.313
Mean Number of Children	3.73	2.97	1.29
Mean Residency at Development (years)	13	11	1.72
Where Lived 5 Years Ago (same development)	56	51	1.71
Housing Development			8.23*
Received Study Letter	50	26	6.68*

Note. NR = non-respondents; R = respondents. n = 16 for NR; n = 100 for R.

[a]All crosstabulations where performed using the same subdivisions as those used for the study population.

*p = <.05

letter. The study population reported homemaker as the primary occupation. However, the same percentage of non-respondents (43%) reported being employed, versus only 17% of study subjects. Regarding housing development differences, a significantly higher percentage of non-respondents versus study subjects were from either College Homes (31%) or Western Heights (50%). These percentages for the study population were 11% and 38%, respectively. Lonsdale represented 31% of non-respondents (26% of study subjects). No responses were received from College Hills, which comprised 25% of the study population. These differences were not viewed as major, given that only two of the associations found in the study population were strongly related to either occupation or housing development. Also, as seen in Table 16, non-respondents differed slightly from the study population on all other demographic variables. Differences noted regarding receipt of the study letter were probably confounded by the fact that the researcher failed to specify the letter in question (i.e., the introductory letter). Thus, non-respondents who received a flyer or reminder note during the course of the study could have been referring to these items rather than the introductory letter. As a result, 50% of non-respondents reported receiving a letter in the mail about the study (vs. 26% of study subjects). These results, like those of the study population, must be viewed cautiously, given the extremely small sample size and relatively low response rate for the follow-up survey.

Information regarding lack of participation in the study by non-respondents is found in Table 17. The primary reason for no participation was lack of knowledge or failure to receive a letter about the study. This is consistent with results of study

Table 17

Reasons for Non-Respondents Lack of Participation in the Study

Reason	**%**
Wasn't interested in it	0
Was afraid to participate	0
Didn't understand what the study was about	18.75
Didn't know or never got a letter about it	25.0
Was not at home when the interviewer came	18.75
Forgot to show up for the meeting	18.75
Meetings were at a bad time for me	6.25
No one ever came to my house	18.75
The interviewer was supposed to do a survey at my house but never came back	0
Some other reason (sickness - personal or children)	12.5
No response	6.25

Note. n = 16. The list represents all choices available to non-respondents. Percentages represent multiple responses.

participants. The other major reasons were each noted equally by 19% of non-respondents. Of particular interest was those women who did not participate because they did not understand the nature and purpose of the study. The women who reported that no one ever came to their home were all from either Western Heights or College Homes, where the researcher relied on contacters to distribute flyers and make the initial contacts. Of equal interest is the fact that none of these women reported lack of participation because of disinterest or fear.

These results suggest that more extensive and effective efforts need to be employed for informing this population about the nature and purpose of health investigations. Probably, personal contact methods over mailed methods would facilitate this. Also, more effective mechanisms for reminding interested residents and for recontacting others need to established.

IV. ANALYSIS OF NUTRITION KNOWLEDGE, BELIEFS, AND DIETARY INTAKE

Given the nonrepresentative population achieved in this study, an analytic investigation of nutrition knowledge, beliefs and dietary intake was not allowed. Therefore, results reported in this section are largely descriptive and exploratory.

Analysis of Nutrition Knowledge

Table 18 shows the test statistics for the total knowledge test. These results are quite comparable to those obtained from the second pilot test found in Table 9. Reliability for the test was once again fairly high at .88 (KR-21).

Table 18

Test Statistics for Nutrition Knowledge Test (Actual Study)

Measure	**Statistic**
Number of items	75
Mean score	52.14
Median score	54.00
Standard deviation	10.92
Reliability (KR-21)	0.88
S.E. of measurement	3.78
Low score	17
High score	72

Table 19 summarizes results of the three sections of the knowledge test (see Appendix F for complete results of the test). The mean score for the 75-item test was 52.14, or 69.5%, placing this population below average on nutrition knowledge. Only 54% of subjects scored 70% or above on the test. Part 2 of the test, the comparison section of foods high in fat, sugar, sodium, cholesterol and calories [most foods], yielded the highest percentage of subjects (80%) scoring over 70%. The multiple choice section yielded only 37% of scores above 70%. Given the very basic nature of the test items and information, these percentages are considered extremely low. Wide variation existed between the three sections on what subjects did and did not know regarding nutrition.

Table 19

Summary of Nutrition Knowledge Test Sections

Section	No. Items	Score Range		Percentages		Statistics		
		Possible	Observed	Of Total	Above 70%	Mean	Median	SD
Total knowledge test	75	0-75	17-72	69.5	54.0	52.14	54.0	10.92
Food groups	20	0-20	0-19	71.5	71.0	14.30	15.0	3.65
Most foods	25	0-25	5-25	79.4	80.0	19.86	22.0	4.90
Multiple choice	30	0-30	3-29	59.9	37.0	17.97	19.0	5.61

The Five Food Groups Section

Some of the most basic information required in nutrition is a knowledge of foods in the various food groups. Table 20 summarizes results from the food groups section of the test, with items arranged from the most to least correct response. The mean score for this section was 14.3 or 71.5%, indicating a low to average level of knowledge about the food groups. Scores ranged from 0 to 19, with a possible score of 20. Seventy-one percent of subjects scored 70% or above on this section.

Subjects were clearly able to identify foods belonging to the meat, fruit and vegetable groups. All foods in these groups, except lemons, were correctly identified by over 83% of subjects. They were less likely to identify correctly all foods in the bread and cereal and milk groups. Rolls and oatmeal were correctly identified by 89% and 76% of subjects, respectively. Macaroni, however, was identified correctly by only 31% of subjects, with it being misclassified as either an other food (21%), milk product (18%), vegetable (11%), or meat (9%). The classification of macaroni as a milk product is understandable, since macaroni and cheese is the primary form of consumption in this group (see "Dietary Intake" section). Cheese and yogurt were fairly well identified, 83% and 77%, respectively. However, subjects did not know that pudding was a milk product (46%), with 28% misclassifying it as an other food.

By far, the most difficult items for subjects to identify were those in the other foods group. All of these foods were identified correctly by less than 65% of respondents. They also represented the highest percentage of don't know responses and misclassifications. Butter, the least identified food item (16%), was classified as

Table 20

Results of Food Groups Section of Nutrition Knowledge Test

Food Item	% Correct	% Don't Know	% No Response	Common Misclass[a]	% Misclass
Pork chops	94	1	1	-------	0
Roast beef	92	1	1	-------	0
Cabbage	92	0	1	-------	0
Bologna	91	0	2	-------	0
Bananas	90	1	1	-------	0
Lettuce	89	0	1	fruit	9
Rolls	89	1	1	-------	0
Pears	88	1	2	veg	8
Cucumbers	84	1	4	fruit	6
Cheese	83	0	2	meat[b]	10
Yogurt	77	3	1	fruit	9
Lemons	76	5	1	veg	12
Oatmeal	76	6	1	other	10
Potato chips	64	11	1	veg	13
Lard	55	22	1	meat	15
Cookies	51	5	2	bread	34
Pudding	46	9	2	other	28
Mayonnaise	45	11	3	milk	30
Macaroni	31	5	2	other	21
Butter	16	5	3	milk	61

Note. n = 100.

[a]Indicates the most common misclassification given for the listed food by ≥ 5% of subjects.

[b]Technically a correct response if cheese is considered a meat alternative.

a milk product by 61% of subjects. Less than half of subjects knew that mayonnaise was an other food (45%), with 30% believing it to be a milk product. Thirty-four percent of subjects thought cookies belonged to the bread and cereal group, 15% viewed lard as a meat product, and 13% identified potato chips as a vegetable. Lard, potato chips, and mayonnaise were the most common items subjects indicated they did not know to which food group they belonged (22%, 11%, 11%, respectively).

The implications are great regarding the misclassification of this latter group of foods. Many of these foods are reported to be used daily or several times a week by subjects. Given the high level of use of butter and mayonnaise in the population, these results suggest the women may be selecting these to fulfill the milk requirement. Likewise, cookies could possibly be selected to fulfill the bread and cereal group. As these foods represent high fat and cholesterol items, there is a clear need to increase the population's knowledge of these items as foods to be used in moderation. In addition, the fact that 50% of the food items were misclassified by 10% or more of the population indicates the need for attention to the five food groups in a nutrition education program.

A related concept of serving sizes should also be considered, especially in relation to these other foods. Test items related to serving sizes were contained on the original knowledge instrument, but were deleted due to very low ratings of judges. However, several of these misclassified foods were the ones for which subjects had difficulty accurately identifying serving sizes during the second pilot test. Misunderstanding of these very basic concepts of the food groups and serving sizes

could have a definite impact on subjects' ability to meet the dietary guideline of eating a variety of foods daily. To do this effectively, one must first be able to identify foods in each of the groups, as well as the correct portions size for them. These results suggest the population may be lacking knowledge and skills in both areas.

Most Foods Section

The most foods section of the knowledge test was directly related to one of the Objectives, which states that 70% of adults should be able to identify the major foods which are low in fat and sodium, high in calories and sugars, and good sources of fiber. High cholesterol foods were added to this section given their importance to cardiovascular health. Questions regarding fiber were placed in the multiple choice section. The food comparisons [food sets] in this section represented a combination of processed, natural, and prepared food items. Particular attention was given to generating food sets based on the customary dietary patterns of the population.

Table 21 summarizes results from the most foods section of the test, again, with items arranged in order from the most to least correct category of response. The mean score for this section was 19.86 or 79.4%, indicating an average level of knowledge for these areas. Scores ranged from 5 to 25, with a possible score of 25. Eighty percent of subjects scored 70% or above on this section. The configuration of this section, a dichotomous arrangement, may have facilitated positive responses.

In four of the five sections, over 80% of subjects were able to correctly discriminate between three or more of the food sets. Only the cholesterol category had three food sets identified correctly by less than 62% of the population.

Table 21

Results of Most Foods Section of Nutrition Knowledge Test

Category	% Correct	% Don't Know	% No Response
Most Sugar			
Frosted Flakes vs. Cheerios	97	1	1
Crackers vs. cookies	94	0	2
Candied sweet potatoes vs. grits	91	1	3
Ketchup vs. soy sauce	67	10	7
Oatmeal vs. pork and beans	62	3	4
Most Fat			
Fried vs. baked chicken	97	0	1
Skim vs. whole milk	89	0	8
Greens with ham hock vs. smoked turkey	85	1	7
Butter vs. cottage cheese	82	1	8
Hamburger vs. potatoes	64	1	4
Most Salt			
Bacon vs. baked veal	92	4	3
Green beans with salk pork vs. margarine	89	3	4
White rice vs. Rice-a-Roni	83	3	5
Frozen vs. canned carrots	80	7	7
Pot pie vs. boiled noodles	75	5	4
Most Calories			
Hard vs. chocolate candy	87	2	3
Fried vs. boiled okra	85	2	7
Chicken with skin vs. lean beef	81	5	3
Baked fish vs. breaded fish sticks	80	3	7
Potato salad vs. baked potato	78	3	8

Table 21 Cont.

Category	% Correct	% Don't Know	% No Response
Most Cholesterol			
Eggs vs. 2% milk	85	4	4
Lean beef vs. chitterlings	82	8	5
Peanut butter vs. mayonnaise	61	11	3
Turkey vs. liver	47	14	6
Potatoes fried in butter vs. oil	42	8	4

Note. n = 100.

Foods high in sugar represented the most correct category, with over 90% of subjects discriminating correctly for three of the five food sets. However, subjects showed difficulty in identifying sugar in condiments (ketchup vs. soy sauce - 67%) and in canned products (oatmeal vs. pork and beans - 62%). The fat category closely followed sugar, with four of the five food sets correctly identified by over 80% of subjects. Only the hamburger versus potatoes set was poorly identified by subjects (64%). Foods high in salt were also well identified, with 80% or more of subjects discriminating correctly for four of the five food sets, except pot pie versus boiled noodles (75%). In the most calories section, only the potato salad versus baked potato set was identified by less than 80% of subjects, albeit slightly (78%).

Subjects clearly had difficulty distinguishing food sets in the cholesterol category. This category also represented the highest percentage of don't know responses. While subjects could accurately identify eggs and chitterlings as high

cholesterol foods (85% and 82%, respectively), they were less likely to distinguish between peanut butter and mayonnaise (61%), with 11% reporting they did not know. For liver and potatoes fried in butter, less than half of subjects identified these as high cholesterol foods (47% and 42%, respectively); 14% and 8% did not know.

These results show two clear patterns. First, and most encouraging, the population, on average, meets and exceeds the national objective of adults being able to identify foods high in fat, sugar, sodium, and calories. For two categories, sodium and calories, subjects greatly exceeded the objective of 70% for all food sets. For the other two categories, fat and sugar, subjects exceeded the objective for three and four of the food sets, respectively. For all four of these, the category average was greater than 80%. The added category of cholesterol was the only one which fell below the 70% level, with a category average of 63%. The results, in part, may reflect the success of media and advertising campaigns which have targeted these areas specifically in recent years. Secondly, close examination of those food sets for which subjects obtained a correct response lower than 85% included items which were either meats, commercially processed (pot pie, pork and beans, Rice-a-Roni, breaded fish sticks, and canned carrots) self-processed (potato salad and fried potatoes), or condiments (butter, ketchup, and mayonnaise). These areas, therefore, represent primary targets for nutrition education in this population. Ability to adequately distinguish between various type meats, commercially and self-prepared foods, and condiments would have a major impact on sodium, sugar, fat, cholesterol, and caloric intake, all aspects of the Guidelines. As these items represent the most important

excesses in the American diet and contributors to the nutrition-related disorders, this population requires enhancement of knowledge and awareness in these areas.

Multiple Choice Section

The multiple choice section was designed to address specifically information related to the Guidelines and Objectives. Table 22 summarizes the results of the multiple choice section, with items arranged in order from the most to least correct. The mean score for this section was only 17.97 or 59.9%, indicating a well below average level of knowledge for these areas. Scores ranged from 3 to 29, with a possible score of 30. Only 37 percent of subjects scored 70% or above on this section. No item achieved a correct response percentage of 85% or more, unlike the other two sections. The multiple selection configuration may have facilitated the variety of responses obtained in this section. This section also generated the most don't know responses of the three knowledge test sections.

For Guidelines information, correct responses ranged from a high of 84% for foods high in vitamin C to a low of 16% for foods high in vitamin A. No clear pattern of correct response emerged for any of the Guidelines. For example, the items related to variety demonstrated varying levels of knowledge, as well as those related to sodium and alcohol.

In addition to knowledge of vitamin C foods, subjects knew most that sodium is another name for salt (83%) and cottage cheese could be used as a milk alternative (80%). While 74% of subjects identified fried foods as a detriment to weight control, 11% felt potatoes were. The various forms of sugar was recognized by 72% of

Table 22

Results of Multiple Choice Section of Nutrition Knowledge Test

Item #	Guideline/Objective	% Correct	% Don't Know	% No Response
Dietary Guidelines				
50	(variety/Vit C)	84	1	0
56	(sodium)	83	8	1
48	(variety/milk substitute)	80	6	0
52	(weight)	74	3	0
55	(sugar)	72	12	1
51	(variety/calcium)	67	17	0
59	(alcohol)	67	17	2
46	(variety/general)	63	9	0
54	(carbohydrate)	62	8	1
58	(alcohol)	61	26	1
57	(sodium)	50	9	1
47	(variety/meat substitute)	44	12	0
53	(fiber)	25	22	0
49	(variety/Vit A)	16	29	0
Objectives for the Nation				
67	(high blood pressure/sodium)	82	4	0
69	(osteoporosis/calcium)	75	8	0
73	(liver disease/alcohol)	71	5	0
61	(weight loss)	71	7	2
64	(heart disease/blood cholesterol)	71	11	0
65	(heart disease/fatty foods)	68	12	0
75	(obesity)	66	9	0
62	(general problems)	66	11	1
60	(fiber)	64	17	1
66	(heart disease/plaque)	62	10	0

Table 22 Cont.

Item #	Guideline/Objective	% Correct	% Don't Know	% No Response
Objectives - Diet-disease links cont.				
63	(general problems)	62	13	0
71	(intestinal/fiber)	62	25	0
68	(stroke/sodium)	56	17	0
72	(dental carries/sugar)	31	4	0
74	(diabetes/weight)	25	16	1
70	(cancer/various)	11	45	0

Note. n = 100. Words in parentheses represent the concept being tested by the item.

subjects, with 12% reporting they did not know. Seventeen percent could not identify a high calcium food or alcoholic beverages as a high caloric and low nutrient item. Sixty-seven percent of subjects answered both of these correctly. Eating many different kinds of foods, a central key to the variety guideline, was identified by only 63% of subjects, with 24% believing variety could be achieved by taking a vitamin pill daily. High carbohydrate foods and moderate alcohol consumption were identified by 62% and 61% of subjects, respectively. Seventeen percent of subjects selected lima beans as a non-carbohydrate food, and 26% could not identify moderate alcohol consumption. Twelve percent reported it to be 3 to 4 drinks per day.

Knowledge about salt substitutes, meat alternatives, fiber, and vitamin A foods was extremely low. Garlic salt, a major additive used in this population, was identified by only half of subjects as an unhealthy substitute for salt. All other

distractors for this item (lemon juice, spices and herbs) were selected by 10% or more of subjects. Forty-two percent of subjects reported potatoes as a meat alternative over black-eyed peas and rice (44%), both staples in this population's diet. Twelve percent did not know. When given the definition for fiber, thirty-two percent of subjects selected fat over fiber (25%), 13% selected starch, and 22% did not know. Twenty-nine percent of subjects could not identify sweet potatoes as a high vitamin A food. Cauliflower and celery were chosen by 27% and 20% of subjects, respectively.

Knowledge related to the Objectives was even less evident, especially for the diet-disease links, which were measured by items 62 through 75. The Objectives state that 75% of the population should be able to correctly associate the suspected diet-disease links for heart disease, high blood pressure, dental caries, and cancer. For this population, only one of these links was clearly understood, that being not surprisingly, hypertension. Eight-two percent of subjects were able to identify sodium consumption as being linked with high blood pressure. For all other diet-disease links, less than 75% subjects responded correctly.

The specific link between fatty foods and heart disease was understood by only 68% of subjects, although 71% did recognize a high blood cholesterol level as being associated with an increased risk for heart attack. Only 62% of subjects identified fat and cholesterol foods as being responsible for plaque formation in the heart's vessels. For each of these areas, 12%, 10%, and 11%, respectively, of respondents did not know. Additionally, 10% of subjects thought a high blood count increased risk for heart attack and 18% reported too much salt as a cause of plaque formation.

The linkages between sugar and dental caries and cancer and various suggested preventive dietary habits were least understood. Only 31% of subjects correctly identified dental caries as the major health problem caused by excess consumption of sugar. An astounding 54% of subjects reported diabetes to be the major problem associated with excess sugar consumption. A mere 11% of subjects could identify low sugar consumption as being unrelated to cancer prevention. Forty-five percent did not know, and 32% of subjects thought neither a high fiber nor low fat diet would prevent cancer (16% each).

Regarding the nutrition-related disorders explored in addition to those listed in the Objectives, seventy-five percent of subjects were able to identify calcium products as being linked with osteoporosis and alcohol with liver disease (71%). However, only 56% identified sodium with stroke and 25% being overweight with diabetes. For these two, 17% and 16% of subjects, respectively, did not know. Excess sugar (35%), salt (24%), and starch (18%) consumption were reported to contribute to diabetes. Items 62 and 63 measured knowledge of several health conditions suspected to be related to nutrition. Sixty-six percent and sixty-two percent of subjects, respectively, were able to identify these disorders. Twenty percent did not perceive heart disease or overweight as being related to nutrition (10% each). An additional 11% and 13% respectively, did not know. Sixty-two percent of subjects identified the importance of fiber to intestinal health, however, 25% did not know. Also, only 64% of subjects identified an apple with the peel as a fiber food; 17% did not know. The Objectives state this should be at 70% for adults. Finally, the Objectives state that 90% of adults

should understand the major weight loss principles of lower caloric consumption and increased physical activity. These were combined in item 61 as the best method for losing weight long term. Seventy-one percent of subjects answered this item correctly, with 10% reporting one should stop eating potatoes and bread in order to lose weight. In addition, only 66% of subjects correctly identified heart disease, hypertension, and diabetes as all being associated with obesity.

These results are significant on two levels. First, they firmly document the specific level of nutrition knowledge and areas of misinformation in this population. While many studies have speculated about the lower level of nutrition knowledge among low socioeconomic, African-Americans, few have clearly identified it. These results contribute to this knowledge base. Secondly, this population ranks well below an acceptable level of knowledge required to implement the Guidelines. An understanding of nutrition terminology, foods containing particular nutrients and additives (especially vitamins C and A, calcium, sodium, sugar, fat, cholesterol, and fiber), and food substitutions, is basic to applying the Guidelines on an individual level. Lack of this information, as demonstrated in this section, in conjunction with deficits mentioned in the former sections, makes it highly unlikely that these Guidelines are being achieved fully in this population. This lack of knowledge is even more evident for the Objectives, where only two diet-disease links were understood by at least 75% of the population. The fact that knowledge levels for all areas were at or well below average indicates this population may be at a potentially higher risk for the development of these disorders.

These results compare negatively, in most respects, with other results from adult populations. As Table 23 shows, percentages for this study population on the selected nutrition information was below those found in other studies, except in the areas of hypertension and heart disease. These two areas are tremendously encouraging, and are probably reflective of the impact of targeted educational efforts to the African-American population over the last several years (Kumanyika, et al., 1985). Regarding hypertension, these results are very consistent with many others which suggest it is one of the few health areas in which African-Americans may be more knowledgeable than Whites (USDHHS, 1985a). Also, for the food groups and weight loss principles, this population is equal in knowledge to other populations.

To further explore and understand this low level of nutrition knowledge, scores for each section of the test were crosstabulated with the demographic variables. Knowledge was dichotomized into high knowledge (for scores at or above 70%) and low knowledge. As may be seen in Table 24, none of the variables were associated with the total knowledge score. This was slightly unusual, as demographic variables, particularly education, income, and race have been reported to be associated with nutrition knowledge in other studies (Eppright et al., 1970; Mann et al., 1988; Newell et al., 1985; Sims, 1976). This result is probably explained by the fact that the study population was very homogeneous. In addition, there was some concern that the higher than expected number of subjects who were either high school graduates or post-high school trained affected knowledge scores. These results suggest otherwise. Actually, although statistically insignificant, a greater percentage of subjects in the

Table 23

Comparison of Percentages for Selected Nutrition Knowledge Information with Other Studies

Knowledge Component	Present Study	A[1]	B[2]	C[3]	D[4]	E[5]	F[6]	G[7]
Mean nutrition knowledge score	69.9	77	61.5	76.7	----	----	75	----
Food groups identification	71.5	----	----	----	----	----	80	----
Food groups misclassification	50	----	51	----	----	----	----	----
Association between sodium and hypertension	82	----	----	----	----	65	----	24
Association between fatty foods/cholesterol and heart disease	68	----	----	----	----	57	----	5
Association between high cholesterol and heart disease	71	----	----	----	86	----	----	----
Appropriate weight loss principles	71	----	----	----	----	70	----	----
Association between sugar/sweets and dental caries	31	----	----	----	----	90	----	----
Association between dietary components of cancer prevention	11	----	----	----	----	50	----	----

[1]Eppright, et al. (1970). Population = 2,000 mothers of preschool children.

[2]Flynn, and Sade. (1989). Population = representative sample of 1,000 U.S. adults 18 years and over.

[3]Fox, and Hackett. (1988). Population = 64 adults participating in a nutrition education program (treatment group pre-test score).

[4]Kumanyika, et al. (1985). Population = random sample of 787 African-American and Hispanic urban adults.

[5]National Center for Health Statistics. (1988). Population = unidentified. Results reported from the 1986 FDA Diet and Health Survey.

[6]Sims. (1976). Population = 163 mothers of preschool children.

[7]USDHHS. (1985a). Population = stratified probability sample of U.S. population 17 years and over (African-American respondents).

Table 24

Crosstabulation Between Demographic Variables and Nutrition Knowledge

	Knowledge Test Section			
	Total Knowledge	Food Groups	Most Foods	Multiple Choice
Demographic Variable	Chi-Square Value			
Age	1.80	2.74	1.09	1.69
Occupation	2.98	.86	1.50	5.69
Education	1.27	1.63	1.83	1.03
Marital status	2.75	7.63	2.32	5.94
Number of children	.60	.86	1.50	.71
Housing development	2.77	8.45*	3.39	.58
Length of residency	.13	1.42	5.60	.18
Where lived 5 years ago	.80	3.83	3.23	9.99*

Note. n and *df* vary for each crosstabulation.

*$p < .05$.

eighth grade or less category displayed higher knowledge than those in the high school plus category (64% vs. 57%, respectively).

The table also shows that only two associations existed between demographic variables and sections within the knowledge test, both related to place of residency. Level of knowledge about the food groups was associated with housing development. Western Heights residents had the highest proportion of persons showing high food group knowledge (87%). This was followed by College Homes (73%) and Lonsdale Homes (65%). College Hills had the lowest high knowledge percentage (54%) and the highest low knowledge percentage (45%) of the developments. Knowledge of the Guidelines and Objectives, as determined by the multiple choice section, was associated with location of residency five years ago. For all location categories except one, another state, low knowledge predominated by 55% or more of subjects. For the same development and another development categories, the percentage of low knowledge subjects was 61% and 100%, respectively. Conversely, women who lived in another state tended to have higher knowledge of multiple choice items (63% vs. 45% and 33% for those living in another part of Knoxville or another part of Tennessee, respectively). For the housing development association, these data may be reflective of the resources available to subjects. It appeared that a wider range and number of social and human service agencies operated out of Western Heights than the other developments. This is probably due to its large size. Several women also spoke of participating in a local nutrition class conducted by one of the residents. Hence, this is not a surprising result. On the other hand, why women who lived in

another state showed higher knowledge for multiple choice items is not clear. Perhaps, they came from states which offered more extensive nutrition education and services at either the high school or community levels, than are offered in either Knoxville or the state of Tennessee. The fact that EFNEP (Expanded Food and Nutrition Program), a major federally-funded nutrition education program for low socioeconomic populations, is not offered in the MLB area is a prime example of this.

One additional association approached significance ($\chi^2 = 5.69$, $p = .058$) and is worth mentioning. Occupation was associated with the multiple choice section, with 76% of the unemployed and 58% of homemakers showing low knowledge. Employed subjects had the highest percentage of high knowledge respondents (59%).

In summary, the overall below average level of knowledge, for various aspects of nutrition, indicates a great need for targeted nutrition education in this population.

Analysis of Nutrition Beliefs

Beliefs Scales

Table 25 summarizes the results of the total nutrition beliefs scale and the individual constructs. As the table shows, alpha reliabilities remained consistent with those of the second pilot test, except for the seriousness scale. Reliability for the total scale was .90, including the cues to action scale in the analysis. Subscale reliabilities ranged from a low .49 for the seriousness scale to .79 for the benefits scale. As shown in Table 26, both pilot test and study reliabilities for beliefs items were quite comparable to those of other recent HBM studies. The seriousness subscale was the

Table 25

Summary of Nutrition Beliefs Scale Constructs

		Score Range		Statistics			
Construct	**No. Items**	**Possible**	**Observed**	**Scale Mean**	**SD**	**Item Mean**	**Alpha**
Total Beliefs Scale	57	51-255	148-245	200.18	24.66	3.93	.90[a]
Susceptibility	8	8-40	21-40	33.76	4.85	4.23	.74
Seriousness	8	8-40	17-40	31.16	5.06	3.90	.49
Benefits	14	14-70	37-70	56.24	7.85	4.02	.79
Barriers	13	13-65	17-63	46.40	9.66	3.57	.81
Cues to Action	6	6-30	11-30	20.86	4.08	3.47	.56
General Health Motivation	8	8-40	18-40	32.51	4.94	4.06	.66

Note. $n = 98$. Two subjects did not complete this section.

[a]Including the cues to action subscale.

Table 26

Comparison of HBM Subscale Reliabilities with Other HBM Studies

Construct	Pilot Test	Present Study	1[a]	2[b]	3[c]	4[d]	5[e]
Susceptibility	.76	.74	.77	.66	.70	.49	.89
Seriousness	.82	.49	.78	.33	.68	.36	.66
Benefits	.81	.79	.61	.77	.82	.49	.82
Barriers	.80	.81	.76	.82	.75	.52	.91
Cues to Action	.57	.56	-----	.59	-----	.47	----
General Health Motivation	.70	.66	.60	.72	-----		.84
Content Area	Nutrition	Nutrition	BSE	Nutrition	Sexuality	Cancer	STDs

[a]Champion. (1984). Population = 301 business and professional women in large metropolitan area.

[b]Contento & Murphy. (1990). Population = 117 adult supermarket shoppers.

[c]Eisen & Zellman. (1986). Population = 203 adolescents enrolled in sex education program.

[d]Price, et al. (1988). Population = 769 African-American adults from randomly selected urban churches.

[e]Simon & Das. (1984). Population = 416 African-American and Caribbean Black undergraduate students.

only one which showed a marked difference from the pilot test analysis, dropping from .82 to .49. The reason for this was not fully clear. Upon reviewing the pilot analysis, this scale was at a moderately high reliability with nine items (.80). Deletion of one additional item increased alpha to .82. Perhaps the removal of this item in some way disrupted the internal consistency of the scale, and needs to be re-entered. Given this low reliability, results for the seriousness scale must be viewed with caution. All other scales, including cues to action, were at an acceptable level of reliability (.50) for assessing nutrition beliefs. Based on these initial encouraging reliability results, additional refinement of the scales and testing of the HBM can continue. These reliabilities also reflect the high level of consistency among judges who reviewed the instrument.

Table 25 shows that scores were markedly positively skewed for all scales. Only the barriers and cues scales came close to spanning the full possible range of scores. Again, the non-representative sample may have produced this result. Overall, the scale and item means indicate fairly positive perceptions regarding the nutrition constructs. The susceptibility scale produced the highest scale mean (84%) and cues to action the lowest (69.5%), with an overall scale mean of 81.7%

For all scales, except barriers, a high score indicated strong positive perceptions regarding the construct being measured. For the barriers scale, due to reversed scoring of negatively phrased items, a high score represents fewer perceived barriers to attaining optimal nutrition. All percentages discussed in the sections below, except where noted, represent the percent of agreement with the concept.

Perceived Susceptibility

Table 27 lists results of responses to the susceptibility subscale items. This construct represented the strongest core of beliefs for subjects (84%). As determined by the scale and item means, the population showed strong perceptions of susceptibility to nutrition-related disorders associated with specific food practices and moderate susceptibility to nutritional inadequacy in general. The strongest perceptions were for susceptibility to teeth problems resulting from excess sugar consumption (92%), teeth and bone problems related to calcium consumption (86%), alcohol-related liver disease (85%), hypertension initiated by excess salt or pork intake (84%), and obesity due to excess fat and sugar consumption (83%). Conversely, only 55% of subjects perceived themselves as susceptible to heart problems due to excess cholesterol. Twenty-four percent of subjects were not sure about this belief and 18% did not know. This result is consistent with knowledge test findings related to the cholesterol issue.

Subjects appeared to view themselves as less susceptible to general nutritional inadequacy, as only 76% and 74% believed that improper eating would either inhibit obtaining all necessary nutrients or cause illness, respectively. Ten and 13% of subjects, respectively, disagreed with these items.

A review of the correlation matrix for this subscale (see Table 28) shows only a few moderately correlated items, with half of them being related to excesses of some kind. Perceptions regarding weight gain related to excess consumption of high fat and sugar foods were positively related to two other excess perceptions: salt and

Table 27

Results of Susceptibility Subscale Items

Item #	Concept	% Agree	% Not Sure	% Disagree	Item Mean
1	Sweet foods could cause teeth problems	92	3	3	4.62
9	Lack of milk products could hurt teeth and bones	86	6	6	4.31
32	Excess alcohol could cause liver problems	85	9	4	4.46
40	Excess salt or pork could cause high blood pressure	84	8	6	4.33
13	Excess high fat and sugar foods could cause weight gain	83	10	5	4.31
45	Won't get all nutrients if don't eat right	76	12	10	4.11
28	Might get sick if don't eat right	74	10	13	4.00
54	Excess cholesterol foods could cause heart trouble	55	24	18	3.71

Note. Percentages for agree and disagree comprised the combined responses of really agree/agree and disagree/really disagree, respectively.

Table 28

Correlation Matrix for the Susceptibility Subscale

Item #	Item 1	Item 9	Item 13	Item 28	Item 32	Item 40	Item 45	Item 54
1	1.0000							
9	.1721	1.0000						
13	.3236	.1121	1.0000					
28	.0553	.0604	.2568	1.0000				
32	.2171	.3118	.3313	.1457	1.0000			
40	.3278	.3112	.4661	.2352	.5779	1.0000		
45	.1708	.2889	.5439	.1067	.3842	.3723	1.0000	
54	.1467	.1607	.4424	.1923	.2324	.2679	.4225	1.0000

Note. n = 98. Two subjects did not answer the beliefs section.

pork consumption as a cause of high blood pressure (.47) and cholesterol foods as a cause of heart trouble (.44). This perception was also more strongly related to the belief that improper nutrition would prevent consumption of all necessary nutrients (.55). Excess alcohol consumption as a cause of liver problems was also positively correlated with perceptions about excess salt and pork as a cause of hypertension (.58). Finally, the perception of improper nutrition preventing consumption the of all necessary nutrients was moderately correlated with the belief that excess cholesterol foods could cause heart problems (.42).

Perceived Seriousness

Table 29 shows results for the seriousness subscale items. This construct represented the fourth strongest core of perceptions (77.9%). As the table shows, a

Table 29

Results of Seriousness Subscale Items

Item #	Concept	% Agree	% Not Sure	% Disagree	Item Mean
19	Fried foods are bad for heart	85	5	8	4.29
47	Excess salty foods make me sick	79	9	7	4.08
3	Bad nutrition affects daily activities	77	14	9	4.14
50	Liver problems are not serious	19	7	72	3.89
11	High blood pressure not that serious because it can't kill you	22	6	69	3.88
14	Bad nutrition not that serious because people I know eat what they and don't get sick	20	14	63	3.71
43	Getting cancer would hurt a lot	62	17	19	3.78
37	Being overweight not a problem as long as you carry it well	32	10	56	3.40

Note. Percentages for agree and disagree comprised the combined responses of really agree/agree and disagree/really disagree, respectively.

broader range of beliefs existed regarding this scale than the susceptibility scale. Perceptions were strongest for the belief that fried foods are bad for the heart (85%). The impact of excess salty foods on illness development (79%) and poor nutrition on daily activities (77%) were the next strongest beliefs.

For three nutrition-related disorders, positive perceptions of their seriousness were not as high. Only 72% of subjects viewed liver problems as a serious health condition and 69% disagreed that hypertension was not serious enough to kill them. For the later, 22% of subjects agreed with this concept. Additionally, only 62% of subjects felt that getting cancer would be painful. For both liver problems and cancer, 19% of subjects agreed with these items. Sixty-three percent of subjects felt that poor nutrition was a serious condition, in spite of what other people eat. For this item, 20% of subjects agreed and 14% were unsure.

One of the most interesting findings in this beliefs core was related to weight. Only 56% of women did not believe the concept that being overweight is alright as long as the weight is carried well. Thirty-two percent of subjects agreed with this item and 10% were not sure. This finding is very consistent with others which report African American women to have a different concept of and perception about weight issues (Kumanyika, 1987). As a result, associations between weight and disease are not clearly understood or accepted, and weight reduction programs are often ineffective. This misperception of weight was further confirmed in the "Other Relevant Information" section.

The correlation matrix for the seriousness scale (see Table 30) showed no item correlations at or above .40. However, the strongest of these low correlations were found for two of the highest rated items (3 and 19 - .38) and among items with the lowest perceptions of seriousness (i.e., items 14 and 37 - .39, and items 37 and 50 - .33). Of note, although extremely low, is the inverse relationship between perceptions regarding cancer as being painful and of overweight as a problem (-.29).

Perceived susceptibility and seriousness combined indicate the person's perceived threat for disease. These data suggest the population sees itself threatened by some nutrition-related disorders, particularly those related to specific food habits. They, however, feel less threatened by nutritional inadequacy in general.

Table 30

Correlation Matrix for the Seriousness Subscale

Item #	Item 3	Item 11	Item 14	Item 19	Item 37	Item 43	Item 47	Item 50
3	1.0000							
11	-.0141	1.0000						
14	.0641	.2875	1.0000					
19	.3751	.1099	.0871	1.0000				
37	.1211	.2860	.3888	.1406	1.0000			
43	.0588	-.0790	-.0343	.0536	-.2936	1.0000		
47	.1332	-.0589	-.0184	.0431	.0318	.1289	1.0000	
50	.2577	.2671	.1849	.0543	.3314	-.0540	.2047	1.0000

Note. n = 98. Two subjects did not answer the beliefs section.

Perceived Benefits

Results of responses to benefits scale items are found in Table 31. Perceptions regarding the benefits of sound nutrition and nutritional practices in preventing nutritional inadequacy and nutrition-related disorders represented the third strongest core of beliefs (80.3%). Subjects' greatest perceptions were regarding the benefits of reading labels for food selection (88%) and use of less sodium for preventing hypertension (87%). For the vast majority of beliefs in this section, subjects demonstrated moderately strong (80% to 83%) perceptions regarding the benefits of the major, current, nutritional recommendations for disease prevention and general nutritional well-being. These included: proper nutrition for energy level, controlling diabetes, and the prevention of diseases in general; less consumption of alcohol, sodium, and fatty foods for the prevention of liver problems, stroke, and heart disease, respectively; varying cooking methods to lower fat intake; and a higher consumption of fruits and vegetables to assist with weight control.

Three beliefs clearly represented the feelings of fatalism regarding health matters often reported among low socioeconomic African-Americans. Item means and agree/disagree percentages show them to be fairly consistent beliefs. Twenty percent of subjects believed there was nothing that could be done to prevent bone disease. Twenty-seven percent felt practicing good nutrition was useless because they were going to die from "something" anyway. And 28% percent believed that changing their eating habits would not help them. For each of these beliefs, a significant proportion of the population was unsure (19%, 14%, 13%, respectively).

Table 31

Results of Benefits Subscale Items

Item #	Concept	% Agree	% Not Sure	% Disagree	Item Mean
7	Reading food labels would help with food selection	88	4	5	4.39
22	Less salt would prevent HBP	87	7	3	4.37
24	Good nutrition for more energy	83	10	5	4.30
29	Less alcohol would prevent liver problems	82	5	10	4.34
2	Less salt would prevent stroke	82	13	3	4.27
48	Good nutrition could control diabetes	81	14	3	4.23
18	Lower fat intake through different cooking methods	81	9	8	4.21
34	Good nutrition for preventing diseases	81	12	5	4.19
56	Less fatty food to prevent heart disease	81	14	3	4.13
20	More fruits and vegetables to control weight	80	14	3	4.08
41	Nothing can be done to prevent bone disease	20	19	58	3.65
44	Good nutrition doesn't matter because going to die anyway	27	14	57	3.54
46	Changing eating habits wouldn't help	28	13	57	3.37
12	Lowering salt and sugar intake by consuming less processed foods	38	28	32	3.16

Note. Percentages for agree and disagree comprised the combined responses of really agree/agree and disagree/really disagree, respectively.

The least believed concept was related to the consumption of less processed foods as a mechanism for lowering salt and sugar intake in the diet. Only thirty-eight percent of subjects agreed with this statement; 28% were not sure and 32% did not know. This broad range of response may indicate a lack of knowledge regarding levels of sodium and sugar in processed foods. This item, in fact, supports results of the most foods section of the knowledge test, whereby, subjects scored lowest in both the sugar and salt categories on items which were processed foods.

The correlation matrix for this scale (see Table 32) further supports these findings. Items in this scale represented the highest number of correlations at or above .40. The highest correlation was between beliefs about lower sodium for the prevention of hypertension and good nutrition for more energy (.69). Lower sodium for hypertension prevention was also associated with less alcohol to prevent liver problems (.47), good nutrition for disease prevention (.41), and less fatty foods for prevention of heart disease (.41). Four other beliefs were correlated with the more energy concept at moderate levels: less alcohol and fatty foods for the prevention of liver (.54) and heart (.41) problems; and good nutrition for preventing diseases (.52) and controlling diabetes (.45). The concept of proper nutrition for disease prevention was also related to nutrition for the control of diabetes (.46) and less fatty foods for prevention of heart disease (.52). Lower fat intake through alteration of cooking methods was moderately associated with the beliefs of good nutrition for more energy and less alcohol to prevent liver disease (.47 each). Nutrition to control diabetes and less fatty foods to prevent heart disease were related at .40. The highest belief of

Table 32

Correlation Matrix for the Benefits Subscale

Item #	Item 2	Item 7	Item 12	Item 18	Item 20	Item 22	Item 24	Item 29	Item 34	Item 41	Item 44	Item 46	Item 48	Item 56
2	1.0000													
7	.3438	1.0000												
12	.0152	-.0466	1.0000											
18	.1786	.1430	.1799	1.0000										
20	.2594	.4694	.0118	.3950	1.0000									
22	.2713	.1331	.1465	.3282	.2722	1.0000								
24	.1784	.0739	.1027	.4706	.2059	.6919	1.0000							
29	.1752	.0020	.2660	.4678	.1607	.4720	.5362	1.0000						
34	.2921	.1278	.1441	.3729	.3590	.4138	.5188	.2738	1.0000					
41	.2304	-.0069	.0698	.0298	.0051	.1504	.1305	.1797	.3373	1.0000				
44	.1077	.1339	.0540	.2373	.1118	.1364	.2762	.2453	.3237	.3756	1.0000			
46	.2903	.1229	-.0117	.2096	.2043	.0567	.1279	.1742	.1586	.1859	.4547	1.000		
48	.2205	.0997	.0124	.1966	.0342	.3036	.4474	.1545	.4635	.2373	.3868	.1031	1.0000	
56	.1993	.0771	.2377	.2458	.0597	.4411	.4107	.2253	.5240	.2577	.2086	.1367	.4039	1.0000

Note. n = 98. Two subjects did not answer the beliefs section.

reading labels for food selection was correlated with a higher consumption of fruits and vegetables for weight control (.47).

Two of the fatalistic beliefs were moderately correlated at .45: good nutrition does not matter because one is going to die anyway and a change in eating habits being of no help. Although low (.39), the other fatalistic belief of there being nothing that one can do to prevent bone disease was positively correlated with the belief that good nutrition does not matter.

These results suggest that the population, for the most part, perceives current nutrition recommendations as beneficial to them. However, there is a fairly significant segment of the population who may not value these recommendations or find them beneficial to their overall and/or nutritional well-being.

Perceived Barriers

Perceptions regarding the barriers to and costs of developing and maintaining sound nutrition and nutritional practices are found in Table 33. This scale represented the second lowest core of beliefs (71.4%), as might be expected for this population. As this scale comprised a large number of negatively worded items, reversed scoring was performed. Hence, a high score indicated fewer perceived barriers to good nutrition. As may be seen from the table, this scale produced some of the lowest percentages for expected responses, with the highest being only 73% and a high item mean of 3.92. These beliefs represent some of the most fascinating observed in the population. They also represent those items which some subjects thought were "crazy," "stupid" or "a trip."

Table 33

Results of Barriers Subscale Items

Item #	Concept	% Agree	% Not Sure	% Disagree	Item Mean
8	Nutrition information a trick to get people to spend their money	18	7	73	3.77
55	Know how to read food labels	70	18	10	3.92
27	Grocery store where shop does not sell nutritious foods	21	7	70	3.69
30	Foods cooked with oil don't taste good	23	8	67	3.60
49	Good nutrition is too expensive	22	10	65	3.73
15	Fixing nutritious foods takes too much time	21	14	61	3.69
42	Good nutrition is more trouble than it's worth	24	13	61	3.60
36	Believe in God, so won't get sick	28	8	61	3.55
51	Don't trust what health professionals say about nutrition	22	17	59	3.56
4	Nutrition programs used by government to spy on people	12	27	58	3.74
10	Baked or broiled meats don't taste good	36	8	54	3.20
21	No transportation to store where could buy better/cheaper foods	41	8	49	3.11
33	Hard time understanding nutrition information	36	18	42	3.21

Note. Percentages for agree and disagree comprised the combined responses of really agree/agree and disagree/really disagree, respectively.

The strongest level of agreement was for the concept that nutrition information was in some way a trick to get people to needlessly spend money. However, only 73% of subjects disagreed with this item; 18% agreed with it. At 70% each were beliefs about personal knowledge of reading food labels and the selling of appropriate nutritious foods at the primary grocery store where subjects shopped. The other 10 beliefs in this section were appropriately answered by less than 68% of the population. Upon close examination of these items, they indicate major predisposing, enabling and reinforcing factors which may influence nutrition behaviors. Since all of these factors were negatively worded, they will be discussed from the perspective of the percentage of subjects that agreed with the items.

Taste of foods was perceived as a major barrier for many subjects. Almost one third believed foods cooked with oil or baked and broiled meats were not tasty (28% and 36%, respectively). The dietary intake data support this finding as demonstrated by the relatively lower percentage of the population that uses oil (27%) versus butter or margarine (over 40%) daily or several times per week. Also fried food items were reported to be consumed much more frequently than baked or broiled foods.

The expense of good nutrition posed perceived barriers for 22% of subjects, who believed having good nutrition was too expensive; 10% of subjects were unsure about this item. Time was also a factor for 21% of subjects, who felt that preparing foods nutritiously was too much of a time investment. The preparation and purchase of nutritious foods inexpensively were areas identified by subjects for inclusion in a nutrition education program for this community (see "Other Relevant Information"

section). Good nutrition being more trouble than it is worth was believed by 24% of subjects; 13% were unsure. What specifically about good nutrition was troublesome for subjects could not be clearly discerned from the statement as worded. However, correlations with this item discussed below provide additional insight.

In spite of the high percentage of subjects who reported that food label reading was not a barrier, 36% of subjects felt that nutrition information overall was difficult to understand. An additional 18% were unsure. This is not a surprising result, since there is a great mis-match between the level of nutrition information available to the public and the public's ability to comprehend it (Nitze, 1987).

Some of the most interesting barriers to good nutrition identified by this population were all related to the issue of trust. As the table shows, these three items were grouped closely by item mean and level of disagreement.

Religious beliefs were identified as a major barrier, with 28% of subjects feeling that their trust in God would prevent illness even in the face of poor eating habits. Parks (1984) identified similar strong religious beliefs in relation to health in a poor rural African-American population. The strong religious beliefs of African-Americans and their association to health are well established (Semmes, 1983; Snow, 1983). However, they often have been traditionally viewed as negative barriers to positive health and well-being. Yet, these beliefs may represent a powerful yet untapped tool through which to conduct health education. As a consequence of this very strong faith in a higher power, many subjects may have actually experienced one or more personal healings and spontaneous recoveries without medical intervention,

but through the power of prayer, the laying on of hands by ministers, and fellowship and sharing of experiences with other believers. As a result, some may have taken this for granted, especially those with nutrition-related chronic diseases who have made dramatic comebacks from near death or severe illness experiences. It is not unusual to hear many African American women following a diabetic coma, severe stroke, or heart attack exclaim: "I know it was God who saved me, even though I didn't do right, by following that diet (or losing weight or giving up some known food component) like I was supposed to. I'm really gonna try to do better this time." Rather than viewing this barrier in the traditional negative sense, it could possibly be used to motivate these women to a more healthful lifestyle because of their religious faith. Freimuth and Mettger (1990) have encouraged exploration of alternative conceptualizations of traditional "negative" labels assigned to hard-to-reach populations, with an emphasis on target audience strengths. This particular belief may be a prime candidate for such an alternative view. Also, this belief coincides directly with the cues belief of accepting nutrition advice from one's minister.

In addition to religious faith, lack of trust in health authorities was also an important barrier, with 22% of subjects in agreement with this item; 17% were not sure. Also, while only 12% of subjects believed that nutrition programs were in some way used by the government to spy on them, almost one third were unsure (27%). This lack of trust in medical authority and the government among African-Americans is also well established. In Gillium and Gillium's hypertension (1984) survey among African-American adults, this belief existed among 48% of people with a history of

hypertension and 57% of those without hypertension. According to Thomas and Quinn (1991), given the justifiable nature of this level of mistrust in health and government programs among African Americans, which in large part emanated from the Tuskegee Syphilis Study, health educators cannot afford to ignore or minimize this barrier when designing and implementing health programs in this population.

By far, the most imposing barrier to good nutrition perceived by subjects was lack of transportation to purchase more nutritious or inexpensive foods. An overwhelming 41% of subjects agreed with this item. This finding matches closely those observed by the researcher during preliminary anthropological observations in these communities. Local grocery stores rarely contained many of the important nutritious food items currently recommended for consumption, such as skim milk, high quality fresh fruits and vegetables, various cuts of lean meats, and low sodium, sugar, fat, and cholesterol items. Regarding the latter, when present, they were usually two to three times the cost than would be the case at similar stores in other communities. On the other hand, high fat, cholesterol, sodium, sugar, and calorie foods, including alcoholic beverages, were in abundance and tended to be the cheaper items. This finding was also clearly documented by Ford and Harris (1988) who investigated the availability, affordability, and cultural appropriateness of selected recommended food items in grocery stores serving a culturally diverse (largely Hispanic and Native American), low socioeconomic population. Their major findings indicated that it would be impossible, without having to drive an hour or more, for a substantial number of people in the study community to buy: skim milk, low salt canned

vegetables, fresh fish, low-fat cottage cheese, frozen or canned fish or chicken, corn oil, or unshriveled and fresh (instead of brown) fruits and vegetables. When these products were found, prices were often exorbitant (e.g., $6.00 for three pounds of fresh chicken or $1.19 for a 3 oz. can of tuna fish). Depending on where subjects lived, access to these products might be nonexistent.

Table 34 shows the barriers scale correlation matrix, which primarily supports findings related to the trust factors. The belief that good nutrition is troublesome was related to four concepts, two of which were trust-related: lack of available nutritious foods at grocery stores (.41), nutrition information used to trick people (.43), lack of trust in health professionals (.54), and religious beliefs (.59). Lack of trust in health professionals was also correlated with the belief that nutrition information is designed to trick people (.49) and religious beliefs (.45).

The results presented throughout this section clearly identify potential imposing barriers to the development and maintenance of sound nutrition in this population. Nutrition education programs must go beyond mere information dissemination and skills development, and address issues of advocacy and empowerment for nutrition issues. Without the proper environmental supports, even the strongest desire to adopt more healthful eating patterns and attempts to actually do so may be thwarted. Programs which fail to take these important factors into account are themselves doomed for failure.

Table 34

Correlation Matrix for the Barriers Subscale

Item #	Item 4	Item 8	Item 10	Item 15	Item 21	Item 27	Item 30	Item 33	Item 36	Item 42	Item 49	Item 51	Item 55
4	1.0000												
8	.4323	1.0000											
10	.1939	.2909	1.0000										
15	.4189	.2922	.3497	1.0000									
21	.1983	.1969	.0316	.0879	1.0000								
27	.3362	.3712	.0901	.3664	.3658	1.0000							
30	.2305	.1482	.3289	.2757	.2657	.2923	1.0000						
33	.0020	.0340	.0036	.1464	.0944	.2822	.1728	1.0000					
36	.1908	.2640	.1975	.3448	.3078	.3713	.1976	.1753	1.0000				
42	.3216	.4287	.2597	.2445	.2296	.4112	.3271	.1264	.5953	1.0000			
49	.2807	.2929	.3322	.3754	.3027	.2989	.3878	.2414	.2410	.2857	1.0000		
51	.4454	.4914	.2938	.2441	.1322	.3566	.2261	.1024	.4485	.5409	.3108	1.000	
55	.2931	.1762	-.0096	.1135	.1820	.0651	.1057	.1146	-.0622	-.0220	.1963	.2047	1.0000

Note. n = 98. Two subjects did not answer the beliefs section.

Cues to Action

Table 35 shows results of the cues to action scale for nutrition-related behavior. This represented the lowest core of beliefs (69.5%), as demonstrated by the low item means and percentages of agreement. For over half of these items, slightly more than 50% or less of subjects were in agreement. This scale also produced the highest percentage of not sure responses.

Surprisingly, the strongest cue to action was reading different books (67%). This was followed closely by listening to advice from friends and relatives (64%). Reading health pamphlets was perceived as a cue by 53% of subjects, and 24% were not sure. The remaining three cues, listening to one's minister, changing diet based

Table 35

Results of Cues to Action Subscale Items

Item #	Concept	% Agree	% Not Sure	% Disagree	Item Mean
53	Read different books	67	14	17	3.71
6	Listen to relatives and friends	64	18	15	3.71
39	Read health pamphlets	53	24	21	3.42
16	Would listen to minister	49	26	22	3.41
57	Would change diet because of disease of friend or relative	49	25	24	3.33
26	TV and radio commercials	49	24	25	3.28

Note. Percentages for agree and disagree comprised the combined responses of really agree/agree and disagree/really disagree, respectively.

on the disease of a friend or relative, and TV and radio commercials were perceived as cues equally by 49% of subjects. For each of these, almost one fourth of subjects were either unsure of or disagreed with the items. The correlation matrix for the cues scale showed only one moderate relationship (.45), that being reading different books and reading health pamphlets (see Table 36).

For item 57, if subjects either really agreed or agreed with this statement, they were asked to write the health problem of a relative or friend that would make them change their diet. As shown in Table 37 subjects would be most willing to change dietary behaviors if a relative or friend developed heart disease (29%), diabetes (18%), or cancer (14%). Unfortunately, the effect of this question was not fully realized as 45% of subjects who should have answered this question did not.

Table 36

Correlation Matrix for the Cues to Action Subscale

Item #	Item 6	Item 16	Item 26	Item 39	Item 53	Item 57
6	1.0000					
16	.2274	1.0000				
26	.0726	.1476	1.0000			
39	.2573	.2548	.1588	1.0000		
53	.2015	.2107	-.0610	.4507	1.0000	
57	.3213	.0955	.0434	.1575	.1342	1.0000

Note. n = 98. Two subjects did not answer the beliefs section.

Table 37

Diseases of Friend or Relative for Which Subjects Would Change Their Diets

Disease	**n**	**%**
Heart disease	14	28.6
Diabetes	9	18.4
Cancer	7	14.3
Hypertension	4	8.2
Stroke	3	6.1
Liver disease	3	6.1
Any disease or health problem	3	6.1
No Response	22	44.9

Note. n = 49. Sixteen subjects (32.7%) gave multiple answers.

The cues to action scale is the least tested and understood of the HBM constructs. Cues are believed to provide the stimulus or trigger for the decision-making process related to the behavior. In the case of this population, these triggers appear to come from two primary categories: print and electronic media and significant others. The role of the latter is well established regarding the positive influence they can have on reinforcing and encouraging positive health behaviors. There is some concern over the former for two reasons. First, as mentioned earlier, print nutrition information tends to be on a significantly higher level than is understood by the general population. Therefore, although subjects may be reading the information, they may not be comprehending it. Secondly, that almost half of subjects rely on electronic media for nutrition information is of particular concern for low socioecono-

mic populations, who have been reported to be most likely to misinterpret nutrition education messages presented in the media (Vermeersch & Swenerton, 1980).

According to Green et al. (1980), health education can be the cue to trigger health behavior change when the predisposing factors represented by the health beliefs have been properly identified. In this regard, the framework for such health education has been established in this study. Given these two cues areas specifically, nutrition education programs for this population would need to consider the development of literacy and culturally appropriate written materials and media messages which are easily understood, and the inclusion of significant others in the educational process as a means of support for and reinforcement of desired behavioral outcomes.

Additional potential cues, as determined from the major sources of nutrition information identified in this study (see "Other Relevant Information" section), need to be added to the cues scale and tested for their strength and influence on nutrition-related decisions and behaviors. Some of these sources were included in the original scale, but were deleted through the judicial review process. Some also conflict with those reported in this cues scale

General Health Motivation

Results of the motivations for health matters in general are presented in Table 38. The motivation scale represented the second strongest core of beliefs and thus supports the researcher's earlier contention that interest in matters of health exist in this low socioeconomic population. The two most strongly held perceptions were the overall importance of good health and weight control, both obtaining an 89% level of

Table 38

Results of General Health Motivation Subscale Items

Item #	Concept	% Agree	% Not Sure	% Disagree	Item Mean
52	Good health is important	89	6	3	4.49
31	Weight control is important	89	5	4	4.39
5	No smoking to stay healthy	82	5	10	4.33
17	Controlling stress is important	81	11	6	4.40
23	Look for new health information	78	9	11	3.93
35	Think about health a lot	73	13	11	4.04
38	Follow the doctor's orders	64	13	21	3.59
25	Sleep 7-8 hours daily	58	12	27	3.53

Note. Percentages for agree and disagree comprised the combined responses of really agree/agree and disagree/really disagree, respectively.

agreement. No smoking (82%) and stress management (81%) were also perceived as highly important health issues. Seventy-eight percent of subjects reported searching out new health information and 73% think about their health often. Following the doctor's orders and obtaining 7-8 hours of sleep daily were the only areas reported by below 70% of subjects; 21% and 27%, respectively, disagreed with these items.

The correlation matrix for the motivation scale (see Table 39) showed two moderate relationships between items, both associated with looking for new health information. These were thinking about health (.64) and the importance of good health (.47).

Table 39

Correlation Matrix for the General Health Motivation Subscale

Item #	Item 5	Item 17	Item 23	Item 25	Item 31	Item 35	Item 38	Item 52
5	1.0000							
17	.3525	1.0000						
23	-.0514	.1691	1.0000					
25	.1758	.0867	.3107	1.0000				
31	.1432	.3335	.2435	.0877	1.0000			
35	-.0536	.2911	.6441	.2915	.1716	1.0000		
38	-.0449	.0186	.2303	.2906	.1843	.3299	1.0000	
50	.0294	.1976	.4743	.1561	.2311	.3381	.1928	1.0000

Note. n = 98. Two subjects did not answer the beliefs section.

These results clearly confirm the high level of interest in health matters in general in this population. This is an important finding, as the HBM assumes that motivation is a necessary condition for action. So often, diverse populations have been described in the literature, and by health professionals, as lazy, lacking interest and motivation in health issues, incapable of implementing health plans, and a host of other negative labels. Rarely have the specific areas of health interest and motivation of these populations been clearly identified in order to appropriately meet their health needs. This demonstration of interest in and motivation for health matters in general provides a fertile framework through which to develop relevant and specific health education strategies.

Modifying Variables

According to HBM theory, any number of modifying variables (demographic, socio-psychological, and structural) may affect individual perceptions regarding susceptibility, severity, and benefits of preventive health actions. In an attempt to determine associations between these variables and HBM constructs, crosstabulations were performed. Each scale was dichotomized into positive and negative beliefs for analysis purposes. The demographic variables are discussed in this section. Nutrition knowledge is discussed in the following section. Dietary intake associations are addressed in that section.

Table 40 presents the results of the crosstabulations between the total nutrition beliefs scale and each of the subscales. As may be seen from the Chi-square analysis, each of the subscales was significantly related to the total beliefs scale, except cues to action. For three of the five scales, seriousness, benefits, and barriers, these associations occurred in the expected pattern (i.e., a significantly higher percentage of subjects showing positive or negative beliefs in both the total and individual scales). For the susceptibility and motivation scales the pattern was slightly different. For susceptibility, although 100% of subjects comprised the positive beliefs category for both total beliefs and the individual scale, the negative beliefs category was more evenly divided. The same pattern was noted in the motivation scale. This was probably due to the fact that these constructs were the highest belief areas, and therefore, had a higher percentage of positively skewed scores.

Table 40

Chi-Square Analysis for Crosstabulations Between Nutrition Beliefs Subscales and Total Beliefs Scale

	Total Beliefs
Beliefs Subscale	χ^{2a}
Susceptibility	35.74*
Seriousness	36.28*
Benefits	52.49*
Barriers	24.95*
Cues to Action	.00
General Health Motivation	12.03*

Note. *df* = 1. n = 98. Two subjects did not answer the beliefs scale.

[a]Yate's Continuity Correction was employed.

*$p \leq .0006$.

Table 41 shows the results of the crosstabulations between the various demographic variables. No associations were found between these variables and total beliefs, susceptibility, seriousness, and barriers scales. The benefits scale showed the most associations, followed by cues and motivation. Surprisingly, the demographic variable with the most significant associations was housing development location.

Housing development location was clearly associated with perceptions about benefits, cues to action and general health motivation. For all of these belief areas, residents of College Homes comprised the largest percentages of subjects with positive beliefs. In the case of benefits and motivation, this was 100%. Western Heights

Table 41

Crosstabulations Between Demographic Variables and Nutrition Beliefs

	Beliefs Scale[a]						
	Chi-Square Value						
Demographic Variable	**Total Beliefs**	**Suscept**	**Serious**	**Benefits**	**Barriers**	**Cues**	**Motivation**
Age	.10	.22	.33	.16	4.29	6.34*	.74
Occupation	1.14	1.11	1.95	7.10*	4.85	2.87	.08
Education	2.32	3.80	3.17	6.03*	2.26	3.24	1.79
Marital status	3.42	4.29	3.41	2.60	3.42	2.16	3.83
Number of children	3.26	.42	.75	1.54	2.64	3.40	.72
Housing development	4.37	4.88	1.06	7.90*	2.30	10.28**	13.37**
Length of residency	.29	.06	.65	2.29	.68	4.62	.96
Where lived 5 years ago	5.36	3.17	1.53	7.18	4.16	3.67	1.17

Note. n and *df* vary for each crosstabulation.

[a]Suscept = susceptibility; Serious = seriousness; Cues = cues to action; Motivation = general health motivation.

*$p < .05$. **$p < .01$.

followed College Homes, with 92% of subjects comprising the positive beliefs category for both benefits and motivation. Cues was 77.8% and 63.2% for College Homes and Western Heights, respectively. College Hills consistently showed the highest percentages of subjects in the negative beliefs category. Reasons for these differences are not fully clear. Possibly residents of College Homes, the oldest development, have been able to overcome or "adjust" to development life in ways not yet attained by residents in other developments, particularly College Hills, the newest development. Western Heights residents, on the other hand, represent persons who stay in the developments for the shortest time periods and may reflect more positive beliefs in general regarding life and their self-efficacy in the area of nutrition.

Benefits was also associated with occupation and education, but in an interesting pattern. Ninety-two percent of homemakers had positive perceptions regarding the benefits of sound nutrition. However, 85% of unemployed versus 64% of employed subjects showed positive perceptions. Employed subjects had the highest percentage of persons falling into the negative beliefs category (35%). Education associations were equally interesting. Ninety-seven percent of women who completed grades nine to 11 had positive benefits beliefs; versus 79% for the high school plus and 70% for eighth grade or less subjects. As expected, the latter group had the highest percentage of people showing negative beliefs (30%), but this was followed by the high school plus group at 21%. Finally, cues to action was associated with age, with women under the age of 30 having more negative cues perceptions (61%) than women either 31 to 45 years (44%) or 46 years and over (27%).

These results identify housing development residency as the major demographic variable associated with the HBM constructs, and the benefits scale as the HBM construct most associated with demographic variables. This information could prove to be useful in targeting housing developments differently for nutrition education efforts. These areas, however, require more extensive exploration into the specific nature of these associations and how they might affect nutrition-related decisions and behaviors.

Relationship Between Nutrition Knowledge and Beliefs

Tables 42 and 43 show results of the correlation between nutrition knowledge and nutrition beliefs. The Pearson Product Moment Correlation Coefficient was used to determine the nature and degree of relationship between the two variables. As may be seen from Table 42, there was a positive moderate correlation between nutrition knowledge and beliefs. The relationship was strongest between the total knowledge and beliefs scores (.53) and between the multiple choice section of the knowledge test and total beliefs (.58). A positive relationship was also found between overall beliefs and the food groups and most foods knowledge sections, but was not as strong (.34 and .24, respectively). Table 43 shows low moderate positive relationships between total nutrition knowledge and four of the HBM constructs (susceptibility - .44; seriousness - .45; benefits - .46; and barriers - .41). Cues and motivation were also related, but to a lesser degree (.23 and .22, respectively). These results are consistent with other studies which have reported nutrition knowledge and attitudes to be moderately related (Eppright et al., 1970; Grotkowski & Sims, 1978; Sims, 1976).

Table 42

Correlations Between Nutrition Knowledge and Total Nutrition Beliefs

	Pearson r Values	
Knowledge Area	**Total Nutrition Beliefs**	**Common Variance (%)**
Total nutrition knowledge	.53**	28.1
Food groups knowledge	.34**	11.6
Most foods knowledge	.24*	5.8
Multiple choice knowledge	.58**	33.6

*p = <.05. **p = <.01.

Table 43

Correlations Between Nutrition Beliefs Subscales and Total Nutrition Knowledge

	Pearson r Values	
Beliefs Area	**Total Nutrition Knowledge**	**Common Variance (%)**
Susceptibility	.44**	19.4
Seriousness	.45**	20.2
Benefits	.46**	21.2
Barriers	.41**	16.8
Cues to Action	.23*	5.3
Motivation	.22*	4.8

*p = <.05. **p = <.01.

Summary of Nutrition Beliefs

This extensive discussion of nutrition beliefs results illustrates several important concepts. First, like nutrition knowledge, this study clearly documents some of the major nutrition-related beliefs in this population, and the population's standing in relation to current nutrition recommendations and advice. Such information has been limited to date. Thus, these data contribute to our understanding of nutrition perceptions in this low socioeconomic population of color. Secondly, these data support Simon and Das' (1984) proposition that the key to use of the HBM for educational diagnosis is the development of a multi-item, multi-scale instrument for each of the individual constructs. Through these individual scales, specific positive and negative nutrition beliefs have been identified which could serve as the specific targets for educational intervention. Thirdly, these data, and the process by which they were generated, support Rosenstock (1974b) and Janz and Becker's (1984) contention that health beliefs need to be clearly identified in the population prior to using them as predictors of behavior. By establishing these beliefs first, we are sure they existed prior to any intervention to alter them. In addition, they could serve as the baseline against which to measure the effectiveness of the intervention. Fourth, there is a strong knowledge component related to health beliefs, as many areas which generated low beliefs also had correspondingly low levels of knowledge. Hence, the development of nutrition knowledge should be an important component of a nutrition education program for this population. The fact that the two are moderately related suggests that a change in nutrition knowledge could produce a change in nutrition

beliefs, and vice versa. Fifth, the "clumping" together of several items in the scales may suggest specific concepts which are unique to this population and need to be explored further through factor analysis. Sixth, the overall low to moderate correlations of the various beliefs items and nutrition scores, with their accompanying common variances, suggest that other factors are probably related to nutrition knowledge and beliefs in this population. In fact, the Grotkowski and Sims (1978) and Sims (1976) studies showed various other influencing factors, including socioeconomic status. Finally, several of the key findings in this section, especially those related to the barriers scale, represent some of the major items that White judges of the instrument recommended for deletion. The fact that they were retained by the researcher and yielded such valuable data support the need for a major leadership role of a researcher of color in the development of research materials for such populations.

The perceptions and beliefs of the HBM have been shown to be alterable. Also, the model suggests that possession of any combination of these beliefs would have an increased probably of compliance behavior regarding the health issue in question. These data show that this population possesses such beliefs at a level which would support recommended changes in dietary patterns. However, below compliance level beliefs identified here need to be carefully and strategically addressed in order to ensure the best possible environment and opportunity for change in this population (see Appendix G for complete results of the Nutrition Beliefs Scale).

Analysis of Dietary Intake

The volume of data produced by the dietary intake section was massive. Since the focus of the nutrition knowledge test and beliefs scale was the Dietary Guidelines for Americans, the Objectives for the Nation, and the most current nutritional principles and recommendations for disease prevention and health promotion, analysis of the dietary intake section from this perspective as well was deemed more appropriate over an item-by-item analysis of the food frequency (see Appendix H for the itemized results of the food frequency). Analysis from this perspective matched the objective of the dietary intake section of the survey, which was to ascertain the nature and level of nutritional intake of the population, on a general level, in light of current dietary information and recommendations.

As discussed in the instrumentation section, the deletion of the servings sizes information prevented the researcher's ability to generate a dietary intake score, which would have allowed for an actual dietary analysis of foods consumed. However, the information presented here yet gives insight into the dietary strengths and deficiencies in the population.

Overall Consumption of the Five Food Groups

Table 44 summarizes the results related to overall consumption of the five food groups and water. Also listed are the recommended number of servings for each category. As may be seen from the table, this population is well below the recommended number of servings for three of the six categories - vegetables, breads and cereals, and water, and is marginally meeting the fruits category. Given the

Table 44

Reported Versus Recommended Consumption of the Five Food Groups and Water

Food Group	Recommended # of Servings	Average # of Servings	% Meet Recommendation
Fruits	2-4	2.2	46
Vegetables	3-5	2.3	35
Meat/Meat alternatives	2-3	2.2	55
Breads and cereals	6-11	3.0	5
Milk/Milk alternatives	2-3	2.5	44
Water	8	2.9	16

smaller range for milk and meats, average number of reported servings was considered adequate. In addition, for all categories, less than 50% of the population was meeting the recommendations. The meats and meat alternatives group was the only one which exceeded 50%. The breads and cereals recommendation was reported to be met by only five percent of subjects, and water by only 16%.

The five food groups, in their appropriate proportions, are believed to provide the necessary variety to the diet that will assist the individual in achieving optimal nutritional benefit, balance, and calorie control. As no one group contains all of the nutrients required by the body, each is necessary and important to the total diet. In their absence or disproportion, one is predisposed not only to various vitamin and mineral deficiencies, but also to problems related to excesses (Sizer & Whitney, 1988). The data reported in Table 44 clearly indicate, without an extensive dietary analysis,

that this population is at seriously high risk for nutritional inadequacy. A closer investigation of the type and nature of foods consumed in each group, as well as selected dietary patterns, further support this finding.

Consumption of Fruits and Vegetables

Table 45 summarizes consumption patterns for the fruits and vegetables groups. The number of fruits consumed per day ranged from zero to eight; for vegetables, the range was zero to six. A higher percentage of subjects meet the requirement for fruits (46%) than for vegetables (35%). However, a significantly higher percentage of subjects report consuming no fruits daily (14%) verses no vegetables (3%). The most popular fruits consumed by 20% or more of subjects daily or several times per week were apples, bananas, grapes, raisins, oranges or grapefruit, orange or grapefruit juice, and various other juices. The latter three were the most frequently reported fruits consumed. Vegetables consumed on a daily or several times per week basis by subjects were green beans, green peas, corn, tomatoes or tomato juice, broccoli, cabbage, greens, spinach, lettuce salad, green pepper, onions, and celery. In addition, over 30% of subjects reported eating three of the five forms of potatoes either daily or three to four times per week: fried potatoes or french fries (30% - mostly fried potatoes), baked potato (36%), and mashed potatoes (34%). Surprising, two of the traditional forms of potatoes generally preferred by African-Americans, sweet potatoes and potato salad, were not reported as high consumption foods.

As might be expected, more fruits (49%) than vegetables (36%) are consumed fresh or raw, with canned fruits and vegetables used sometimes by 63% and 59% of

Table 45

Consumption Patterns for Fruits and Vegetables

	Fruits (%)				Vegetables (%)			
Pattern	**%**	**A[a]**	**S**	**N**	**%**	**A**	**S**	**N**
Amount Consumed								
Less than required servings daily	22	----	----	----	53	----	----	----
Meets required servings daily[b]	46	----	----	----	35	----	----	----
Exceeds required servings daily	9	----	----	----	3	----	----	----
None consumed daily	14	----	----	----	3	----	----	----
Method of consumption								
Fresh or raw	----	49	41	5	----	36	45	16
Frozen	----	8	46	41	----	15	55	26
Canned	----	17	63	15	----	24	59	8
Cooked (boiled)	----	16	34	44	----	34	50	12
Cooked with fat or butter	----	----	----	----	----	21	53	17
Cooked with oil or margarine	----	----	----	----	----	27	51	17
Cooked with salt	----	----	----	----	----	28	36	30
Vitamin A Consumption								
At least one source daily	----	----	----	----	23	----	----	----
One source 3-4 times per week	----	----	----	----	28	----	----	----
One source once per week or less	----	----	----	----	22	----	----	----
No source weekly	----	----	----	----	24	----	----	----
Vitamin C Consumption								
At least one source daily	28	----	----	----	33	----	----	----
One source 3-4 times per week	21	----	----	----	27	----	----	----
One source once per week or less	24	----	----	----	24	----	----	----
No source weekly	24	----	----	----	14	----	----	----

Note. n = 97. Three subjects did not answer this section. Non-respondents are not included.

[a]A = always; S = sometimes; N = never.

[b]Required no. servings per day: fruit = 2-4; vegetables = 3-5.

the population, respectively. An encouraging finding was that oil or margarine was reported to be used always when cooking vegetables at a slightly higher frequency than fat or butter (27% vs. 21%, respectively). Also, 30% of subjects reported using no salt in the preparation of vegetables. These findings may indicate the population's attempts to implement recommendations for the reduction of fat and sodium.

Vitamins A and C are considered two of the most important vitamins required in the diet, with vitamin C being required daily and vitamin A every other day. According to the table, only a small percentage of the population is meeting these requirements. Daily vitamin C sources were reported to be consumed by only 28% of the population for fruits and 33% for vegetables. Vitamin A vegetable consumption was even less at 23%. Also of interest here was the level of consumption of the cruciferous vegetables believed to be important in cancer prevention. According to the food frequency, only 21% of the population consumed at least one of these vegetables on a daily basis and an additional 27% consumed one at least three to four times per week. However, 21% of subjects consumed none of these vegetables on a weekly basis. Cauliflower and brussels sprouts were reported to be either never eaten or not liked by 42% and 44% of the population, respectively. But, broccoli, spinach, cabbage, and the dark leafy greens were reported to be consumed once or several times per week by 40% or more of subjects. Lack of available high quality, inexpensive fruits and vegetables in local grocery stores may be a negative enabling factor for this food group.

These patterns are encouraging, and demonstrate some possible movement of the population in the direction of current dietary recommendations for fruits and vegetables. However, level of consumption for many of these items may be too low to confer expected health and nutritional benefits.

Consumption of Meats and Meat Alternatives

Meats and meat alternatives consumption information is summarized in Table 46. This group represented the highest percentage of subjects meeting the current required number of servings (55%), with the daily number of servings ranging from zero to six. The most popular meats consumed either daily or three to four times a week by about 20% or more of subjects were fried chicken, beef, hamburger or cheeseburger, ground beef or meat loaf, lunch meats, bacon, and breakfast sausage or patties. The two most popular meat alternatives were eggs and peanut butter or peanuts. Eggs, lunch meats, bacon, and fried chicken were reported to be consumed on a daily basis by about 10% of subjects for each.

As may be noted from this list, these items represent foods highest in cholesterol, fat, and saturated fats. On average, based on frequency of consumption, red meats are preferred to chicken and fish by about 31% of subjects, with only 18% consuming chicken or fish more frequently than red meats. An additional 30% of subjects appeared to consume red meats and chicken or fish equally. Regarding the alternatives, only nine percent of subjects reported always using beans and peas instead of meat, one of the major current recommendations for this food group. However, 44% indicated they do this sometimes; 30% never use beans and peas as a

Table 46

Consumption Patterns for Meats and Meat Alternatives

Pattern	Consumption (%)			
	%	A[a]	S	N
Amount Consumed				
Less than required servings daily	16	---	---	---
Meets required servings daily[b]	55	----	---	---
Exceeds required servings daily	7	----	---	---
None consumed daily	1	----	---	---
Method of consumption				
Fry meat	---	27	51	5
Roast, broil, bake, or boil meat	---	28	54	3
Choose lean or low fat meats	---	24	45	14
Eat the fat on meat	---	4	38	41
Eat the skin on chicken	---	29	38	16
Eat beans or peas instead of meat	---	9	44	30
Meat Alternatives				
1-4 alternatives daily	13	---	---	---
1-2 different alternatives several times/week	22	---	---	---
3-6 different alternatives several times/week	31	---	---	---
No meat alternatives weekly	18	---	---	---
Meat Preference				
Red meats over chicken or fish	31	---	---	---
Chicken or fish over red meats	18	---	---	---
Equal consumption of red meats and chicken or fish	30	---	---	---
No meats consumed weekly	6	---	---	---

Note. n = 85. Three subjects did not answer this section. Twelve subjects' information was deleted due to a questionable response pattern. Non-respondents are not included.

[a]A = always; S = sometimes; N = never.

[b]Required no. servings of meat = 2-3 per day.

meat substitute. Some form of meat alternative appeared to be consumed at least on a weekly basis by slightly more than 50% of the population.

Other meat-related dietary behaviors included a mixture of patterns. While 41% of subjects reported they never eat the fat on meat, 29% always eat the skin on chicken and 27% always fry their meats. Other methods of meat preparation - roasting, broiling, baking or boiling - were reported to be always performed by 28% of the women. Also, 24% said they always choose lean or low fat meats.

These results are consistent with other studies regarding the higher consumption of high fat, cholesterol, and fried foods among low socioeconomic populations of color (Koh and Caples, 1979a; Perkin et al., 1988; Resurreccion and Pagruo, 1988). Overall, these patterns suggest slightly less movement towards current recommendations regarding the lower consumption of foods high in saturated fat and cholesterol. While some are encouraging (i.e., the nearly equal percentage of subjects who always fry or otherwise prepare meat), others are areas of major concern. The level of consumption of these high fat and cholesterol foods invariably place the population at great risk for various nutrition-related disorders. These findings, in conjunction with the lower level of both knowledge about and beliefs towards the fat and cholesterol issues, identify this area as a primary target for nutrition education in this population. It should be noted also, that many of the primary meats and meat alternatives consumed frequently by the population represent some of the least expensive forms of meat. Finally, given this apparent high attachment to meat, it is

no surprise that two of the few associations found regarding dietary intake and other factors were related to meats.

Consumption of Breads and Cereals

Consumption patterns for the breads and cereals group are presented in Table 47. This group had both the lowest number of average servings as well as the lowest percentage of subjects meeting the current recommendation of six to 11 servings daily. Even when the old standard of 4 servings per day is applied, this low rate persists. Daily number of servings ranged from zero to seven.

The primary breads and cereals consumed daily or three to four times per week by 20% or more of subjects were white bread, dark bread, rolls or biscuits, cornbread, hamburger and hot dog buns, sweet cereals and Corn Flakes/Rice Crispies type cereals, oatmeal and grits. Subjects showed a much higher frequency of consumption for white over dark bread (50%) than vice versa (16%). They also had a much higher frequency of use for non-sweet over sweet cereals (33%) versus sweet cereals over non-sweet (14%). In addition, although white bread was consumed most frequently, 49% of subjects reported consuming dark bread on either a daily or weekly basis.

Several interesting factors may be related to these findings. First, as reported in the knowledge test, foods in this area were some of the least understood items. One of the major misclassifications in the food groups section was from this category (macaroni). Another (oatmeal) was correctly identified by only 76% of subjects and 34% said cookies belonged to this group. The carbohydrates question was answered correctly by only 62% of subjects. Secondly, foods from this group are believed by

Table 47

Consumption Patterns for Breads and Cereals

Pattern	Consumption (%)
Amount Consumed[a]	
Less than required servings daily	50
Meets required servings daily[b]	5
Exceeds required servings daily	0
None consumed daily	3
Breads Preference	
White over dark bread	50
Dark over white bread	16
Equal consumption of white and dark bread	13
No breads consumed weekly	8
Cereals Preference	
Sweet cereals over non-sweet	14
Non-sweet cereals over sweet	33
Equal consumption of sweet and non-sweet cereals	24
No cereals consumed weekly	16

Note. n = 87. Three subjects did not answer this section. Ten subjects' information was deleted due to a questionable response pattern. Non-respondents are not included.

[a]Twenty-nine subjects did not answer this question. This was probably due to its position on the survey (i.e., the top of the page following the listing). Thus, subjects probably did not see it.

[b]Required no. servings of breads and cereals = 6-11 per day.

many women to be the primary ones that should be eliminated from the diet for weight reduction. Hence, 10% of women in this survey felt that not eating potatoes or bread was the best method for long term weight control. These data may suggest a very poor understanding of the nature and purpose of foods in this group. As foods from this category are recommended to be the primary component of the diet, it is important that women in this population gain clarity about them. Since these foods provide the body its primary source of energy, and this population highly perceived good nutrition as important for increasing energy levels (83%), possibly concepts related to these foods could be easily translated into workable and understandable terms for these women during a nutrition education program.

Consumption of Milk and Milk Products

Table 48 shows consumption patterns for the milk and milk products group. Daily number of servings ranged from zero to six, with 44% of subjects meeting the recommended number. As the table shows, whole milk is still significantly the preferred form of fluid milk (51%) over low fat forms (18%). It is also the primary milk product consumed. Few of the other milk products were consumed regularly by subjects. Those that were, again, represent items which are high in both fat and sodium, such as the wrapped cheese slices and Velvetta cheese. Both cheeses were used daily or three to four times per week by more than 25% of the population. Ice cream was also reported to be consumed fairly frequently during the week by close to 50% of the population. Three of the major lower fat milk products - low fat milk, cottage cheese, and yogurt - were reported to be either never eaten or disliked by

Table 48

Consumption Patterns for Milk and Milk Alternatives

Pattern	Consumption (%)
Amount Consumed	
Less than required servings daily	16
Meets required servings daily[a]	44
More than required servings daily	18
None consumed daily	3
Milk Preference	
Whole over low fat milk	51
Low fat over whole milk	18
Equal consumption of whole and skim milk	12
No fluid milk daily	7
Milk Alternatives	
1 milk alternative consumed daily	14
2-3 milk alternatives consumed daily	8
More than 3 milk alternatives consumed daily	3
No milk alternatives consumed daily	64
Feel sick after consuming milk products	
Yes	24
No	64

Note. n = 89. Three subjects did not answer this section. Eight subjects' information deleted due to questionable response pattern. Non-respondents are not included.

[a]Required no. servings of milk = 2-3 per day.

substantial percentages of the population (25%, 34%, 33%, respectively). Twenty-four percent of subjects reported having a potential problem with milk consumption. I n light of this latter finding, previously discussed taste issues (many women commented that they hated the taste of skim milk or yogurt), and limited availability and/or expense of low fat milk products in many grocery stores, creative strategies for helping this population achieve milk recommendations are needed. Perhaps greater emphasis should be placed on increased consumption of moderately high calcium foods already consumed by the population, such as the various dark greens, cabbage, black-eyed peas, and macaroni and cheese.

Consumption of Mixed and Other Foods

The mixed foods section did not yield much significant information, except to confirm that macaroni and cheese is the primary form of macaroni consumed by the population. In future administrations of this instrument, the researcher would delete this section entirely and incorporate some of these items in other sections.

Information pertaining to the other foods section is shown in Table 49. These foods were included since they represent some of the highest sources of fat, sugar, sodium, and calories in the diet, and have been reported to be used excessively by low socioeconomic and African-American populations. For the most part, however, these items were not reported to be used as excessively as was expected.

The primary fats used by the population were butter and margarine, which were very close in frequency of use on a daily or three to four times per week basis (25% vs. 24%, respectively). Forty percent of subjects used them equally. In addition,

Table 49

Consumption Patterns for Selected Other Foods

Pattern	Consumption (%)
Fats	
Daily/Weekly fat consumption[a]	26
Butter over margarine	25
Margarine over butter	24
Equal consumption of butter and margarine	40
No butter or margarine used	2
Liquid oil or over lard	19
Crisco over lard	25
Lard over oil or Crisco	3
Use oil, Crisco, lard equally	12
No oil, Crisco, lard used	4
Sweet Food Items[a]	
Daily/Weekly consumption of sweet snacks	19
Daily/Weekly consumption of sweet condiments	23
Daily/Weekly consumption of sweet drinks	34
Salty Food Items[a]	
Daily/Weekly consumption of salty snacks	21
Daily/Weekly consumption of salty condiments	21

Table 49 Cont.

Pattern	Consumption (%)
Water[b]	
1-2 glasses per day	12
3-4 glasses per day	29
5-7 glasses per day	19
8 glasses per day	16
More than 8 glasses per day	2
No water consumed daily	9
Other Practices[c]	
Eat at fast food restaurants	19
Add sugar to food	23
Add salt to food	39
Add pepper to food	46
Use herbs and spices in cooking instead of salt	33
Use fat, oil, butter, or margarine in cooking	52

Note. n = 91. Three subjects did not answer this section. Six subjects' information was deleted due to a questionable response pattern. Non-respondents are not included.

[a]Indicates the percentage of subjects reporting consumption of these items either daily or 3-4 times per week.

[b]Required no. glasses of water = 8 per day.

[c]Indicates the percentage of subjects reporting these practices either daily or 3-4 times per week.

of subjects reported using liquid oil and 35% Crisco or some other type of shortening. A very positive finding was the percentage of subjects who indicated they either never use or dislike lard (50%), gravies with meat drippings (25%), or fatback or salt pork (26%), all items which have been traditionally associated with poor African Americans and are severely high in saturated fat, cholesterol and sodium. A few subjects indicated that they returned to the use of lard because oil was too expensive.

Both sweet and salty food items were not reported to be used at the same level of frequency as reported in other studies among low socioeconomic populations. Only 19% of subjects reported consuming one or more sweet snacks on a daily or three to four times per week basis; this was 23% for the sweet condiments and slightly higher for sweet drinks (34%). Regarding the latter, 39% of subjects reported daily consumption of soda and 18% drink Kool-Aid or other sweet drinks daily. Fifty percent never use or dislike diet soda. Consumption rates for salty snacks and condiments were slightly lower (21% each). Also, alcohol consumption was reported to be very low, with about 60% of women indicating they never use or dislike alcohol.

By far the most revealing information in this section was the limited consumption of water. Although 61% of subjects reported drinking water daily, only 16% consumes water in its appropriate amounts. An additional 19% said they drink five to seven glasses daily. Possibly the high percentage of consumption of other beverages offsets any potential problems that might arise from such a low water intake. As the nutrient is deemed the most essential for the body (Sizer & Whitney,

1988), it should be emphasized in a nutrition education program as equally important as considerations regarding fat, sodium, sugar and cholesterol.

The final list of food practices was included in an attempt to obtain more general information regarding specific behaviors. These data show encouraging information in this population, and represent the percentage of subjects who practice these daily or three to four times per week. Only slightly more than 50% reported using any kind of fat in cooking. Although 39% add salt to food, 33% use herbs and spices instead of salt; 46% add pepper (although it is not known whether this is in place of salt). Only 23% add sugar and a low 19% frequent fast food restaurants. The latter may be more cost than behavior related.

These data, for the most part, do not necessarily show anything new. Documentation of dietary intake patterns of low socioeconomic populations is probably one of the most well established nutrition areas for this group. However, what is different regarding these data, is the use of the accompanying knowledge and beliefs data which may both help to explain these patterns and suggest avenues for effective and strategically focused interventions to address these patterns. Few studies have either explored or effectively connected the three areas. In this regard, this study is an additional tool for our understanding and targeting of this group.

Crosstabulations of Dietary Intake

Tables 50 to 52 show the crosstabulations of consumption for the five food groups with the demographic variables, nutrition knowledge, and nutrition beliefs, respectively. As may be seen, few associations existed between these variables.

Table 50

Crosstabulations Between Demographic Variables and Consumption of the Five Food Groups

	Food Group					
	Chi-Square Value					
Demographic Variable	**Fruit**	**Vegetable**	**Meat**	**Bread**	**Milk**	**Water**
Age	6.76	10.24	5.37	2.60	13.27*	2.93
Occupation	5.44	4.82	5.30	3.47	2.60	1.74
Education	11.54	6.92	1.80	6.16	14.03*	1.58
Marital status	6.00	12.90	14.65	20.60	8.91	7.76
Number of children	3.97	3.86	6.71	5.09	8.34	.41
Housing development	13.43	19.38*	24.35*	13.21	12.83	3.20
Length of residency	3.90	3.16	12.64	7.08	13.16*	2.06
Where lived 5 years ago	9.18	10.78	19.48	8.84	11.76	5.25

Note. n and *df* vary for each crosstabulation.

*$p < .05$.

Table 51

Crosstabulations Between Nutrition Knowledge and Consumption of the Five Food Groups

	Food Group					
	Chi-Square Value					
Knowledge Area	**Fruit**	**Vegetable**	**Meat**	**Bread**	**Milk**	**Water**
Total knowledge	7.11	.94	1.62	2.12	2.62	3.21
Food groups	8.35*	9.35*	.95	.73	1.36	.44
Most foods	3.51	.95	2.60	1.38	.19	3.27
Multiple choice	7.01	.10	4.08	2.11	1.81	.08

Note. n and *df* vary for each crosstabulation.

*$p < .05$.

Table 52

Crosstabulations Between Nutrition Beliefs and Consumption of the Five Food Groups

	Food Group					
	Chi-Square Value					
Beliefs Area	**Fruit**	**Vegetable**	**Meat**	**Bread**	**Milk**	**Water**
Total beliefs	.90	1.87	2.43	3.49	2.79	.14
Susceptibility	2.70	1.09	5.38	1.58	2.85	.17
Seriousness	2.57	1.15	3.40	2.37	2.08	.01
Benefits	1.80	1.42	3.00	2.37	4.85	.84
Barriers	1.19	4.41	1.75	2.40	3.56	.68
Cues to action	4.70	6.89	3.21	2.18	1.27	.62
General health motivation	.66	6.11	16.62*	4.73	3.47	1.97

Note. n and *df* vary for each crosstabulation.

*$p < .003$.

This may indicate that other factors play a role in dietary intake in this population. Also, the nonrepresentative nature of this population cannot be discounted. Also, food group consumption is a crude measure of nutritional adequacy. Possibly, more specific measures would demonstrate additional associations between these variables.

Of these associations, three were related to milk, two to meat, and one to fruits, the three groups with the highest percentages of subjects meeting the current serving recommendations. Also of interest is, again, the finding of two associations with housing development location. This persistent finding throughout this section may indicate the need to carefully structure nutrition education programs among housing development residents, who although comprise a development population, may differ greatly from one development to another in perceptions, needs, and knowledge regarding nutrition matters.

Caveats Regarding Dietary Intake Measurement

The dietary intake section was the longest and most difficult section to complete. Given the difficulty in using the Health Habits instrument, and repeated changes in methodology for this section, the researcher suspects this may not be an effective method for generating accurate dietary intake data from this population. The key word here is accurate.

Part of the problem rested with the length of the instrument. Often, by the time this section was reached, subjects were tired and ready to take a break. A 10 minute break was built into the group sessions following completion of the knowledge and beliefs scales. For those groups who wished to continue, answers were observed

to be given hastily and at random. Large sections of the intake data were deleted from analysis due to questionable patterns of response (e.g., circling all of one number for an entire section or a persistent diagonally circled pattern of response).

The other major problem lies with requesting subjects to specifically pinpoint how often foods are consumed. Even with persistent probing, realistic answers often were not given. For example, for the water question, several people reported they drank "a couple gallons" a day. Responses such as "a lot" or "as often as I can get it" were quite common for many of these items. Also, the researcher noticed a particular interpretation for the daily consumption response among these subjects. Some subjects reported eating certain foods daily or three to four times per week which based on the nature, preparation required and availability of the foods made this response questionable. This especially seemed apparent in the meats and mixed foods sections. Examples include: roast beef or steak, barbecue ribs, veal or lamb, shrimp, crabs and oysters, chitterlings and pig's feet, pizza, beef stew, lasagna, chicken or turkey with dressing, and even fried chicken. Upon persistent and focused probing, it was discovered that what many subjects essentially meant when they circled #1 was that "I like the food so much I *could* eat it every day" or "I would *like to* eat it every day, *if I can get it*." These are two vastly different concepts from the one being requested in a food frequency - that being, "How often *do* you eat this food?"

Finally, a typographical error was noted on the instrument which may have affected both the <u>never eat/don't like</u> and <u>don't know</u> categories of response. The original listing of numbered choices were arranged from one to seven, matching the

seven categories. The researcher then decided to switch the number seven don't know response to number eight, in order to be consistent with the knowledge test. The switch was made on the posters and cards used to help subjects with this section, but unfortunately not on the questionnaire. These dual numbers may have confused many subjects, as columns six and seven were most frequently crossed out or written over. This potential problem was evidenced by the fact that according to food frequency results, some subjects do not know the following foods: apples, orange juice, corn, cabbage, fried chicken, beans, various breads and cereals, milk, soup, butter, and cookies and candy. It is highly unlikely, even in this population, that this is accurate.

Given the high level of deleted information and the potential to misinterpret or misrepresent responses, the results of this section must be considered tenuous. In addition, the time and effort required to obtain such data may suggest the need for an alternative method of generating dietary intake information from this population.

Summary of Nutrition Knowledge, Beliefs and Dietary Intake

The information presented throughout this section suggests a need for and potential openness to nutrition education among this housing development population. The data show clearly an overall less than average level of nutrition knowledge for several major nutrition principles, particularly those associated with the diet-disease linkages. Knowledge data also indicate, however, that the population does possess knowledge levels which equal or exceed national levels for a variety of general and specific nutrition information. This indicates the ability of the population to

adequately identify and interpret nutrition information. Openness to nutrition education is suggested by the generally high level of nutrition and general health beliefs expressed by the population. For all scales, saving barriers and cues, subjects perceived nutritional inadequacy and nutrition-related disorders as personally threatening, and their accompanying recommendations for prevention beneficial. These beliefs, however, were not uniform across all nutrition-related diseases or nutritional states. In addition, a substantial proportion of the population showed conflicting beliefs, as well as potential barriers which may inhibit the implementation of nutritional guidelines and principles. Finally, the overall dietary intake status of the population, as judged by food group consumption, was again both below average and average for the various groups. Dietary patterns showed a mixture of positive pursuits in line with current nutritional principles and practices, and less than desirable behaviors which may place the population at higher risk for nutritional inadequacy. These latter data, however, must be viewed cautiously.

The preceding information, when combined with other relevant community-based health and nutrition information from the target group, provide a powerful tool and framework through which to develop a culturally relevant nutrition education program for this low socioeconomic population.

VI. ANALYSIS OF OTHER RELEVANT INFORMATION

While the structured questionnaire format provides useful and standard information, it is limited in its ability to generate other equally important data, largely from the target group's perspective, which would be useful for the development of a nutrition program. This section of the survey, therefore, was designed to provide such information. Parks (1987) utilized this method among hypertensives to gather relevant and somewhat conflicting information (i.e., from the professionals' viewpoint) regarding the development of support groups for them. This information serves to ensure that the targeted community's interests and expectations are established prior to program development. In the view of this researcher, data in the former sections are not as meaningful in the absence of information from this section. Further, regarding the HBM, this section provides additional information on modifying variables which may influence identified beliefs.

Nutrition-Related Health Problems and Pregnancy

An additional measure of the nutritional adequacy of a population may be indicated by the number and type of nutrition-related disorders in the population. The major nutrition-related disorders reported by the population are listed in Table 53. The table shows that all nine of the disorders which were the focus of this study were reported to be present in this population. Eighty-six percent of the study population reported having at least one of the nutrition-related disorders. An astounding 40% of

Table 53

Reported Nutrition-Related Diseases

Problem	% Yes	% Don't Know	% No Response
Teeth problems	55	3	1
Overweight	45	3	2
High blood pressure	38	0	3
Diabetes	20	4	2
Heart disease	13	5	2
Liver disease	9	4	4
Cancer	7	4	4
Stroke	6	3	2
Bone disease	3	6	3

Note. n = 99. One subject did not answer this section.

subjects reported having three or more of these problems, with the maximum number of health problems of any kind reported being 10. As might be expected, the top five nutrition-related disorders were: teeth problems (55%), obesity (45%), hypertension (38%), diabetes (20%), and heart disease (13%). The other four problems were experienced by less than 10% of the population. For persons reporting five or more problems, invariably, two of them were hypertension and obesity. These data are consistent with numerous studies that have documented excess prevalence of nutrition-related problems among low socioeconomic populations of color (Kumanyika, 1990).

In addition to the nutrition-related health problems, subjects reported a number of other health conditions, which are shown in Table 54. Respiratory problems and

Table 54

Other Health Problems Reported

Problem	% Other	% Total Subjects
Respiratory problems[a]	22	6
Arthritis	19	5
Kidney problems/failure	15	4
Seizures	15	4
Asthma	15	4
Thyroid problems	11	3
Nervous condition	7	2
Tumors (unspecified)	7	2
Various other problems[b]	44	12

Note. n = 27. Nine of these subjects reported having two or more additional health problems. Ten subjects did not know if they had other health problems.

[a]Includes the following problems reported: breathing, lung, sinus, emphysema, and bronchitis.

[b]Includes the following problems reported by one subject each: eyes, female, dysplasia, back, knee, colon, edema, colon, nervous stomach, low blood, low oxygen on the brain, sclerosis.

arthritis where reported by 22% and 19%, respectively, of subjects who reported other problems. Kidney problems, seizures and asthma were also reported (15% each), as well as a host of other disorders. This wide array of problems indicates this relatively young population to be in less than optimal physical health.

Table 55 summarizes interesting data related to medications taken and dietary changes made for the reported health conditions. Thirty-seven percent of subjects reporting health problems were taking medications for them. Fifty-one percent of the medications were for hypertension, followed by diabetes (22%), respiratory problems (14%), and heart disease (11%). For the three nutrition-related disorders, this represented 50%, 40%, and 31%, respectively, of those would had the problems.

Table 56 shows further interesting information in relation to Table 55. Subjects with health problems were asked if they had changed their diets because of the problem and to identify the specific changes made. Thirty-four percent of subjects with problems indicated they had changed their diets, with the top five conditions being the major ones for which changes had been made. Once again, as shown in Table 56, one half of people who changed their diets did so because of hypertension, followed by diabetes (26%) and obesity (18%). Heart disease, and surprisingly, teeth problems, equally represented nine percent. The interesting fact from this table is that an almost equal percentage of subjects with hypertension were willing to change their diets as take medications (45% vs. 50%, respectively). For diabetes, the percentage of subjects making dietary changes exceeded the percentage taking medication (45% vs. 40%, respectively). For heart disease, these percentages were reversed, with a

Table 55

Medications Taken for Reported Health Problems

Problem	% Med Subjects	% Subjects with Problem	% Total Subjects
High blood pressure	51	50	19
Diabetes	22	40	8
Respiratory problems	14	83	5
Heart disease	11	31	4
Seizures	8	75	3
Arthritis	8	60	3
Nervous condition	5	100	2
Asthma	5	50	2
Thyroid	5	67	2
Kidney	5	50	2
Problems not listed	5	----	2
Various other problems[a]	19	----	7

Note. n = 37. One subject failed to specify for which health problem the medication was being taken. Thirteen subjects reported taking medication for more than one problem.

[a]Includes medications reported for the following problems by one subject each: stroke, liver, overweight, back, knee, nervous stomach, teeth.

Table 56

Health Problems For Which Diet Changes Were Made

Problem	% Change Subjects	% Subjects with Problem	% Total Subjects
High blood pressure	50	45	17
Diabetes	26	45	9
Overweight	18	13	6
Heart disease	9	23	3
Teeth	9	5	3
Doctor changed diet	6	----	2
Various other problems[a]	24	----	8

Note. n = 34. One subjects failed to specify for which health problem diet was changed. Seven subjects reported changing their diets for more than one problem.

[a]Includes changes reported made for the following problems by one subject each: stroke, liver, cancer, seizures, kidney, breathing, low blood, high cholesterol.

higher proportion of problem subjects taking medications (31%) versus making dietary changes (23%). The percentage of problem subjects making dietary changes was much lower for both obesity (13%) and teeth problems (5%).

Table 57 displays the specific changes made by subjects for these problems. In light of the five major problems identified for changes, the primary changes made - lower sodium (35%), lower fat and cholesterol (29%), lower sugar/sweets (29%), carbohydrate control (12%), and general dietary changes (12%) - were all appropriate. These data suggest both a willingness and ability of the population to carry out dietary change for nutrition-related conditions. For some problems, this willingness appeared to equal or exceed willingness to take medication.

This information represents an exciting finding for the program planner to consider when developing a nutrition program for this group. Special and separate nutritional aid to people with chronic diseases was noted by many women as a major area of need in the community, especially for hypertension and diabetes. Several women suggested possible "disease-related" support groups or clubs to assist them with both establishing and maintaining diets appropriate for the health problems they experienced. As two diabetic women stated: " I know *what* to do, but I need help from somebody else who understands the problem to make sure that I do it (or keep doing it)."

Five study subjects were pregnant, ranging from five to nine months. Two planned to breast feed their children and two did not (one subject did not respond). No clear reasons were given for not wanting to breast feed their children.

Table 57

Dietary Changes for Health Problems Reported

Changes Made	% Change Subjects	% of Subjects with Problems[a]	% Total Subjects
Eat less or no salt	35	14	12
Eat less or no fat and cholesterol foods[b]	29	12	10
Eat less or no sugar/sweet foods or chocolate	29	12	10
Eat less bread, potatoes, or starches	12	5	4
Watch/Changed diet in general	12	5	4
Switched from whole to skim milk	6	2	2
Other changes (one response each)	26	31	9
Make my own food (eat out less)			
Stopped eating cheese			
Started taking iron pills			
Drinking more milk			
Drinking more juices			
Switched to unseasoned foods			
Eating more salads			
Started walking more			
Followed doctor prescribed diet			

Note. n = 34. Two subjects failed to specify dietary changes made. Seventeen subjects reported making multiple changes in their diets.

[a]Percentage of subjects reporting a nutrition-related health problem (n = 85).

[b]The following changes are included in this category: eating less pork, using less butter in cooking, eating fewer fried foods, baking foods instead of frying them.

Perceptions of Weight, Health Status, Nutrition Knowledge, and Nutrition Problems

Information generated from this section provided additional insight regarding specific perceptions of the population about personal and community levels of well-being and nutritional adequacy. These data are summarized in Table 58.

By far, the most intriguing information in this section was related to perceptions about weight. Women were asked to provide their height and weight, and then asked if they considered themselves under-, over- or average weight. These perceptions were then compared with the "Suggested Weight for Adults" table in the pamphlet "Eating Right with the Dietary Guidelines" (1991). Women were considered correct in their perceptions if they were within ± five pounds of the weight range given for their height and age. The table suggests the lower end of the range corresponds with female weights and the higher end with male weights. The table also allows for slightly higher weights among older women (35 years and over) versus younger women (under 35 years). Estimations were only able to be performed for those women who gave both height and weight data. Twelve women did not.

The mean height for younger women was 64 inches (or 5'4"). However, mean weight was 165.18 pounds, with a range of 108 to 314 pounds. The mean height for older women was 63.95 inches (or approximately 5'4"), with a mean weight of 170.77 and similar range of 99 to 350 pounds. These figures show an obvious and serious problem of excess weight among these women. However, for some women, a strong misperception about their weight prevailed.

Table 58

Perceived Weight, Knowledge, and Personal and Community Nutrition Problems

Health Area	Reported Data	Observed Data[a]
Height and Weight		
Average reported height (inches)	64.0	----
Average reported weight (lbs)	170.3	----
Perceived underweight (%)	9	6
Perceived overweight (%)	55	72
Perceived average weight (%)	34	8
Perceived Nutrition Knowledge (%)		
Know a whole lot	10	55.2
Know a lot	12	58.6
Know some	26	51.0
Don't know much	42	51.5
Know almost nothing	8	45.3
Personal or Family Nutrition Problem (%)		
Yes	14	----
No	52	----
Don't know	33	----
Community Nutrition Problem (%)		
Yes	38	----
No	14	----
Don't know	44	----

Note. n = 99. One subject did not answer this section.

[a]For weight: % of women underweight, overweight, or normal weight as judged from the "Suggested Weight for Adults" table in the Dietary Guidelines. For 12 women, no heights were available to make a comparison. For nutrition knowledge: mean knowledge test scores for each response category.

Nine percent of subjects believed they were underweight. Applying the principles discussed above, 67% of these women were accurate in there perceptions. The other 33% of women were found to be average or normal weight. Fifty-six percent of women perceived themselves as being overweight. Based on the table, these women were completely accurate in their perceptions (100%). Women who perceived themselves as average weight, however, had strong misperceptions. Of the 35% of women who perceived themselves as average weight, 83% were inaccurate. Twenty four of the 29 women in this group were in fact obese, with a weight range of 110 to 215 pounds. Forty-eight percent of these weights were at or above 150 pounds. Combining all of this information for the 86 women who reported height and weight data, seven percent were underweight, eight percent average weight, and an alarming 84% overweight. This rate is 1.9 times higher than the obesity rate reported to exist among African-American women in general (44%) and 2.3 times higher than the rate for low socioeconomic women (37%) (USDHHS, 1991). Rivo et al. (1992) also found the rate of obesity and other disease risk factors to be twice as high among public housing residents than residents of the larger poor community.

The clearly identified belief among African-American women that being overweight is "okay," accompanied with a lower level of obesity-related knowledge, consumption of more calorie dense food items, and misperceptions about personal obesity, could impose major barriers to nutrition education among these women. Creative methods for helping women overcome these deficits will be required.

Table 58 also shows results regarding subjects' perceptions about level of nutrition knowledge, and the existence of personal and community nutrition problems. Subjects tended to be more accurate with knowledge versus weight perceptions, in that, those subjects who perceived themselves to know much about nutrition, actually obtained the higher nutrition scores and vice versa. The most accurate ratings were among subjects who knew "almost nothing" about nutrition. These women had an average knowledge score of 60%, versus 74% and 78% for women who felt they knew "a whole lot" or " a lot," respectively. These data parallel those of Mann et al. (1988), whereby a significant, positive relationship existed between subjects' perceived and actual levels of nutrition knowledge.

Regarding the existence of personal nutrition problems, only 14% of subjects believed either they or someone in their family had a nutrition problem. Thirty-three percent did not know. As seen in Table 59, the major personal problem identified was having a specific disease or health problem (36%), followed by not eating or liking vegetables and a poor appetite (14% each). Conversely, thirty-eight percent of women felt the community had a nutrition problem; 44%, however, did not know. The primary community nutrition problems identified by the women were: problems related to children (26%), improper eating (21%), excess consumption of sweet, junk and fast foods and specific health problems (18% each). The specific problems related to children merited a separate table (see Table 60), as many women had very strong feelings about this issue. Comments displayed in the table were made largely by middle aged and older subjects, and represent a wide range of issues, including excess

Table 59

Personal and Community Nutrition Problems

Problem Area	%
Personal Problems	
Specific health or physical conditions[a]	36
Not eating/liking vegetables	14
Poor appetite/Not wanting to eat	14
Don't eat right	14
Other problems[b]	36
Community Problems	
Problems related to children	26
Improper eating habits	21
Excess consumption of sweet/junk/fast foods	18
Specific health problems[c]	18
Food purchasing problems	8
Excess alcohol consumption	8
Don't eat at all (drug-related)	5
Other problems[d]	16
Don't know	8

Note. n = 99. One subject did not answer this section.

[a]Includes: diabetes, overweight, heart disease, hypertension, lactose intolerance, and smoking.

[b]Includes: don't follow doctor prescribed diet; don't follow exercise plan; don't get enough to eat; eat too many starches and fats; although what to eat, need encouragement.

[c]Includes: some over- or underweight; people stay/get sick all the time; a lot of high blood pressure and diabetes; people don't take care of themselves.

[d]Includes: not cooking; need more fruits; poor eating habits; lack knowledge of how to eat right; don't get enough to eat; we all have problems.

Table 60

Community Nutrition Problems Specific to Children

Eat too much junk/high sugar/high fat foods instead of nutritious foods
Mothers don't cook nutritious foods for them
Mothers don't feed them right
Mothers lack nutrition knowledge on how to feed/cook for children or the importance of nutrition
Go to the candy/corner/ice cream stores instead of eating good foods
Don't get enough food/Look malnourished
Don't eat right/proper foods
Need more milk
Don't get enough rest
Don't get enough water
Don't get enough vegetables
Don't know what good foods are (like greens)
Need more cooked foods instead of bologna sandwiches
Diets lack variety (i.e., eat a lot of the same things all the time)
Go all day with just junk foods, so on a sugar high all day
Too much hot dogs and hamburgers, which is not good for anyone

Note. The majority of these comments were offered by middle aged and older respondents. The first seven were noted by 2 or more of respondents to this question. All others represent singular responses.

consumption of non-nutritious foods, the inadequacy of mothers in various areas, and lack of milk, water, rest and vegetables. Possibly, these older women could be used in a nutrition program for younger mothers to address some of these key concerns.

The final perceptions solicited from subjects in this section were ratings of personal and community health and nutritional status, and the meanings of proper and improper nutrition. Table 61 shows that women appeared to be fairly consistent with their personal ratings, in that, they tended to rate their personal and nutritional status similarly. Hence, excellent health and nutrition status were perceived by five percent and 11% of subjects, respectively. Very poor status for both areas, was reported by

Table 61

Ratings of Personal and Community Health and Nutritional Status

Rating	**% Personal Health Status**	**% Personal Nutritional Status**	**% Community Nutritional Status**
Excellent	5	11	4
Good	20	19	10
Fair	41	34	29
Poor	26	28	33
Very poor	6	6	16
Don't know	1	0	5
No response	1	1	3

Note. n = 99. One subject did not answer this section.

six percent of women. Most women, however, viewed their health and nutritional status as fair (41% and 34%, respectively). The reverse was true for perceptions regarding the community's nutritional status, whereby, 33% viewed it as being poor and 16% as very poor. This difference in perception of the "self" versus the "community" was mentioned earlier and would need to be considered in the development and delivery of a nutrition program.

Tables 62 and 63 list subjects' definitions for good nutrition and a nutrition problem. The meaning of good nutrition was largely viewed as being healthy (26%), obtaining the proper foods (21%), possessing specific health or physical conditions (17%), and eating a balanced diet (14%). Responses to the meaning of a nutrition problem often were simply stated in the reverse terms for the meaning of good nutrition. Thus, subjects thought a nutrition problem meant not eating or getting the proper foods (30%) or nutrients/food groups (12%), having general (12%) or specific (11%) health or physical problems, and being in poor health in general (10%). As can be seen, no definitive explanation was derived for either. Careful examination of notes to the tables clearly show an extensive array of responses for each, ranging from getting regular check-ups to having pretty teeth and complexion (meaning of nutrition); and the body breaking down or lacking nutrition knowledge (meaning of nutrition problem). This very broad range of responses to both of these questions may indicate that the population really does not know the meaning of either. Therefore, a nutrition program for these women needs to invest some time in helping them to clearly define these basic nutritional concepts.

Table 62

The Meaning of Good Nutrition

Meaning	%
Being healthy/in good/better health	26
Eating/Getting the right foods/Eating right	21
Specific health or physical conditions[a]	17
Eating/Having well-balanced diet/meals	14
Very important (for health or better life)/It means a lot	6
Specific eating behaviors[b]	5
Other general statements[c]	5
Don't know	7
No response	6

Note. n = 99. One subject did not answer this section.

[a]Includes: getting regular check-ups, less stress, having pretty teeth or soft skin complexion, not being sick, keeping health problems down, having more energy, not being tired, feeling good all the time, exercise, taking care of yourself, being in good shape, having a healthy/better body, weight control, a longer/better life, having a better mind, a better you inside.

[b]Includes: not eating a lot of salt, eating raw vegetables, eating no fat or cholesterol, the way you eat, drinking plenty of water, staying on your diet, eating a lot of good foods, having good eating habits.

[c]Includes: buying and cooking the right foods, having proper nutrition knowledge, doing/eating what you're supposed to, good for your health, I guess you need it.

Table 63

The Meaning of a Nutrition Problem

Meaning	%
Not eating/getting right/proper foods/Not eating right	30
Not getting proper nutrients/food groups/Being malnourished	12
General health or physical problems[a]	12
Specific health or physical problems[b]	10
Being in poor/bad health/Unhealthy	11
Specific eating behaviors[c]	7
Something missing from the diet	4
Other general statements[d]	6
Don't know	19
No response	15

Note. n = 84. One subject did not answer this section. % reflects multiple responses.

[a]Includes: being/getting sick or having a problem, the body breaking down/going wrong, not taking care of your body/self.

[b]Includes: over- or underweight, heart disease, high blood pressure, low blood, anorexia, mental and physical problems.

[c]Includes: eating junk foods, eating foods with little nutritional value, eating too many high sugar, fat or salt foods, not eating, not watching what you eat, lacking high fiber foods, not eating low fat and cholesterol foods, having poor eating habits.

[d]Includes: the need to eat the right foods, eating fruit, something to do with your nutrition level, lacking proper nutrition knowledge, how to season food, the way you eat, a bad situation, the right and wrong way to eat, not doing the right thing, staying in good health, am I healthy, it's nice to have one.

Sources of Nutrition Information

Subjects were asked to identify all sources of nutrition information from a listing of 20 health professionals, significant others, agencies, and various media sources (see Appendix I for full results of this section). They were then asked to indicate the source from which they obtained the most information. Table 64 summarizes these interesting results. By far, the most important source of nutrition information for this population was reported to be the physician.

Physicians were reported to provide a lot (40%) or some (40%) nutrition information by 36% of subjects. This finding was quite surprising in light of the

Table 64

Major Sources of Nutrition Information

Sources	% Major Source	% Total Source[a]
Doctor	36	80
WIC program	27	63
Health department	13	72
Magazines	11	73
Television	8	75

Note. n = 85. One subject did not answer this section. Question not applicable to 3 subjects who reported no source of nutrition information. Eleven subjects did not answer this question.

[a]Reflects the combined percentage for a lot and some information.

aforementioned beliefs against trust in health authority. Physicians were followed by the WIC Program (27%) and the local health department (13%). Magazines and television were the primary sources of information for 19% percent of subjects. The media finding is similar to the one identified in the cues to action scale. Obviously, deciphering nutrition information presented in the media would need to be a strong component of a nutrition education program for this population.

Also surprising was the relative lower ranking of family, friends and the church as sources of information, all traditionally viewed as major buffers and supports in poor communities. Friends were ranked as the eighth most important source and family even lower at 12th. Although subjects said they would listen to their ministers give advice about nutrition in the cues to action beliefs scale, church was ranked last, with a total source percentage of 52%. Hospitals and clinics ranked one step above churches, with a source score of 71%, indicating a more available information source. These data possibly suggest that the housing development population may not rely as heavily on these traditional sources as do other low socioeconomic populations. Or, they may indicate, based on the cues data, that these could be potential channels, if information became available through them.

Perhaps there is validity to the recent findings of Ammerman et al. (1992) who assert that the primary care physician may represent one of the few sources of preventative care and, possibly, accurate nutrition information for low income people. . Their study showed that when physicians are trained well in nutrition education, and possess accompanying low literacy nutrition materials, they can effectively communi-

cate nutrition messages and advice to the satisfaction of the poor population. In light of these findings, medical personnel should not be excluded from consideration as possible channels of nutrition information for this group. Finally, the most highly rated sources identified here need to be added to the cues to action scale to further assess their potential impact on actually changing nutrition behaviors.

Food Purchasing Issues

The food purchases section was designed to ascertain particular factors which may impact nutrition decisions, including influence, location of shopping, food labels, and expenses.

Table 65 summarizes results of factors which influence food decisions. When asked who or what most influences personal decisions regarding the purchase and consumption of foods, subjects largely reported no one (39%), with most stating they influenced themselves. This response mirrors general health motivation data which showed subjects to have a very high personal interest in and concern for matters of health. This self motivation could be a key concept to reinforce in a nutrition program. When there was an influence reported it usually came from a significant other (children -12%, doctor - 11%, or family member, usually a parent - 11%). Various media information sources (11%) and personal health status (10%) also were reported as influences. This finding lends further support to previous ones which suggest an interest in and motivation for nutrition and health matters in the population.

Table 65

Factors Influencing Food Decisions

Factor	%
Self/No one influences me	39
My children	12
Information sources[a]	11
My doctor	11
A family member[b]	10
My health	10
Amount of money to spend for food	7
Health facility/program[c]	5
TV/TV commercials	4
Other factors[d]	7
Don't know	4

Note. n = 84. One subject did not answer this section. Thirteen subjects did not answer this item. % reflects multiple responses.

[a]Includes: health information, newspapers, food labels, magazines, books, store where shop.

[b]Usually a parent for 75% of respondents.

[c]Includes: local hospital, health department, WIC program.

[d]Includes: other health professionals, appearance of foods, price of foods, nutritional value of foods, friends.

Table 66 describes information related to various food purchasing issues. Given the previous information generated about grocery stores, the information in Table 66 which identifies the primary stores which service this population is crucial. Kroger was reported as the primary place for grocery shopping by 45% of subjects, followed by Winn Dixie (26%), Food Lion (13%) and Save-a-Lot (11%). About 20% of the population indicated they shop at various stores. Where subjects shopped was directly related to housing development location. Thus, College Homes and College Hills residents, who do not have immediate access to any of the larger chain stores reported higher percentages for shopping at various locations and smaller local stores (40% and 27%, respectively, vs. 13% for Lonsdale and 16% for Western Heights). Conversely, residents of the latter two developments reported the highest percentage of shoppers at Kroger (50% and 26%, respectively).

This information could be used positively in several ways. First, a transportation system could be developed among subjects to those stores which offer the best quality foods inexpensively. Secondly, an advocacy component of a nutrition program could be developed, whereby subjects are mobilized and encouraged to approach store owners regarding the availability and affordability of various items. Ford and Harris (1988) found that while some store owners were resistant to recommendations, many were willing to offer products requested by the population. They simply had not been asked to do so. Thirdly, the stores themselves could be targeted as potential providers of more literacy appropriate information, pamphlets, signs, labels, etc, which would better assist their low socioeconomic clientele. Finally, by knowing where the vast

Table 66

Food Purchasing Issues

Issue	%
Most Frequent Place of Grocery Shopping	
Kroger	45
Winn Dixie	26
Food Lion	13
Save-a-Lot	11
Buy for Less	9
Food City	9
Other major food chains[a]	9
Other stores/places[b]	7
Don't know	2
Read Food Labels When Shop[c]	
Always	18
Sometimes	63
Never	16
No response	2
Understand Food Labels	
Yes	54
No	8
Sometimes	36
No response	1

Table 66 Cont.

Issue	%
Labels Help with Food Selection	
Yes	48
No	15
Sometimes	35
No response	1
Monthly Expenditures for Food[d]	
Average monthly expenditure **(in dollars)**	210
$100 or less	8
$101 to $150	18
$151 to $200	26
$201 to $299	29
$300 or more	12
Don't know	7
What Use for Food Purchases[e]	
Cash	6
Food stamps	35
Both cash and food stamps	59

Note. n = 92 for stores. One subject did not answer this section and seven did not answer this item.

[a]Includes: Red Stores, Coy Wright, Water Market, White Stores, General Nutrition, and Cas Walkers.

[b]Includes: R-H Grocery, Chicken City, fruit stands/gardens, produce/farmer's markets, various stores.

[c]n = 99 for food label information. One subject did not answer this section.

[d]n = 89. One subject did not answer this section. Ten subjects did not answer this item.

[e]n = 97. One subject did not answer this section. Two subjects did not answer this item.

majority of subjects shop for foods, field trips to these stores can be built into the educational program for: 1) demonstrations of food label reading; 2) fruit, vegetable and meat selection; 3) food variety; 4) identification and selection of foods high and low in fat, sodium, sugar, cholesterol, and calories; 5) economic issues; and 6) other areas of interest and need identified by subjects.

Regarding food label reading, information reported here was consistent with beliefs data which suggested subjects viewed label reading as important and beneficial to developing good nutrition. Forty-eight percent of subjects reported the labels help them in food selection. The data in Table 66, however, do suggest the population requires some assistance in this area, as only 18% reported always reading labels and 36% understood them only sometimes. Also, 16% of the population never reads food labels. Nutrition programs for low socioeconomic groups require more creative and literacy appropriate strategies for teaching food label reading.

The final food purchasing issue was monthly expenditures for food. The average expenditure was $210 per month. When this figure is divided by the average number of children (2.97) plus an adult, this averages out to about $53.00 per month per person for food. For the 26% of women spending $150 or less, the average was $38. Expenditures ranged from approximately $60 to $500, with the largest expenditures obviously associated with larger families. Fifty-nine percent of subjects use both cash and food stamps; 35% use food stamps alone. Given this relatively low level of expenditure for food, it is no wonder that significant percentages of the population participate in various food assistance programs.

Food Assistance Programs

Food assistance information is found in Table 67. Sixty three percent of subjects participated in the food stamp program only. In addition, 22% of the women were WIC participants and five percent participated in the Agricultural Extension Program. The later represents exclusively Western Heights residents who participated along with a local resident employed by the agricultural program from the University of Tennessee to conduct nutrition education in this population. Fifty-four percent of subjects reported that their children participated in the school lunch or breakfast programs. Knowledge of these programs in the community would be important so that duplication of efforts do not occur. Also, it may be more beneficial to align new programs with existing, trusted ones, in order to best meet the needs of the population.

Another sign of inadequate monthly food supply is reflected by the 24% of subjects who report having to get emergency food. Twenty-nine percent obtain such assistance once or twice a month. About 50% obtain assistance every three to six months, sometimes or once a year (17%) each. Twenty-one percent get the assistance when their food stamps are late or more towards the end of the month. FISH, a local food distributor, was the primary source of assistance for 67% of subjects requiring help, followed by the Baptist Center (21%), a local multi-purpose, religious organization. Areas churches and the Salvation Army were each a source for 13% of subjects. Forty-two percent reported they get assistance from various sources. The primary reason for obtaining emergency food assistance, as might be expected, was running out of or low on foods (46%). Women generally reported this was at or near

Table 67

Various Forms of Food Assistance

Assistance Area	%
Food Assistance Programs	
Food stamp program only	63
WIC and food stamp program	22
Agricultural extension only	5
Food stamp program and agricultural extension	1
Other program	1
No food assistance programs	7
No response	2
Children in School Lunch or Breakfast Programs	
Yes	54
No	7
Not applicable	33
No Response	5
Emergency Food	
Yes	24
No	70
No response	5
Frequency of Emergency Food (% of yes respondents)	
1-2x per month	29
1-2x every 3-6 months	17
Sometimes	17
Once a year	17
When food stamps are late	13
Towards end of month/When food runs out	8

Table 67 Cont.

Assistance Area	%
Source of Emergency Food (% of yes respondents)	
FISH	67
Baptist Center	21
Area churches	13
Salvation Army	13
Ladies of Charity	4
No response	8
Multiple sources	42
Reason for Emergency Food (% of yes respondents)	
Run out of or low on food	46
Financial problems[a]	17
To get (extra) food	13
Hungry	8
No response	17

Note. n = 99. One subject did not answer this section.

[a]Specific reasons include: run out of food stamps or money by the end of the month, no money, food stamps are late, not budgeting correctly.

the end of the month. Financial difficulties, such as running out of food stamps or money at the end of the month, lack of money, late food stamps, and improper budgeting were reported by 17% of subjects. Thirteen percent get the food simply because it is available or to obtain "extra" food. Eight percent were hungry when they obtained emergency food.

In light of this and the foregoing information, it is no wonder that some of the primary educational areas identified by these women for inclusion in a nutrition education program centered around the purchase and preparation of inexpensive foods, and food budgeting.

Nutrition Education Program Needs

One of the most critical questions to be answered regarding the development of any health education program for a population is: What are the specific needs, desires, and interests of the population regarding the program - i.e., its location, best times and days for implementation, information dissemination methods, and topics to be addressed? Many program planners attempt to answer this question alone, or do so exclusively from the perspective of the sponsoring agency. In the view of this researcher, however, the best way to answer this question is to very simply ask the population. When this information is combined with the needs and constraints of the sponsoring agency and information from the social and epidemiological diagnoses of the population, then a more effective and satisfactory program may be developed for the target group. The final section of the survey was designed to ascertain the

particular needs, desires, and interests of the population regarding the development and implementation of a nutrition education program for their community.

Table 68 shows the population's interest in a program and needs regarding possible locations, times and days for implementation. The majority of subjects (76%) reported that they would attend a nutrition education program offered to this community. Only three percent of subjects said they would not attend. This response, once again, matches the high interest in health and nutrition expressed by the population throughout this study. Possibly some of the information dissemination methods recommended by subjects would motivate participation by the 17% of subjects who were not sure if they would attend a program.

Sixty-two percent of subjects felt the best location for a program would be a facility on or near the development premises, which is not a surprising result. A few subjects (7%) suggested the program be held at a non-development facility to give residents a chance to "get away from" the development once in a while. Thirty percent of subjects would prefer a program offered in the evening; 22% felt afternoon would best. For the latter, several women indicated "late" afternoon or specifically at 3:00 or 4:00 p.m. Only 18% of subjects suggested that a program be held in the morning. These results support the earlier discussion regarding the morning hours being inappropriate for conducting interviews. Apparently, the same would hold true for program implementation. The beginning (21%) or the end (20%) of the week were reported to be the best days for a program over mid-week (10%). Thirty-four percent of subjects, however, failed to answer this question.

Table 68

Nutrition Education Program Needs - Attendance, Location, Times, and Days

Area	%
Possible Attendance	
Yes	76
No	3
Don't know	17
No Response	4
Where Program Should be Held	
A facility at/in the area of the development	62
Some other facility	7
Other comments	3
Don't know	17
No response	11
Best Time of Day for Program	
Morning	18
Afternoon	22
Evenings	30
Other time	3
Don't know	13
No response	14
Best Day for Program	
Beginning of the week (Monday or Tuesday)	21
Middle of the week (Wednesday)	10
End of the week (Thursday to Saturday)	20
Other days (any day, any weekday, 2x or 3x/week)	10
Don't know	13
No response	34

Note. n = 99. One subject did not answer this section. Percentages reflect multiple responses.

Table 69 shows the information dissemination methods subjects felt should be used for a nutrition education program in this community. Print methods (53%) were recommended as the best way to inform the population, with flyers being the primary method suggested (28%). A variety of personal methods were recommended by 26% of subjects, all of which entailed some form of face-to-face interaction (except phone calls). Media methods were recommended by only eight percent of subjects. The fact that flyers were singly the top method recommended for informing the community about a program was evidenced by efforts utilized in this study.

Subjects were asked what needed to be done to encourage individual attendance at a nutrition education program. This question was considered important as low socioeconomic groups and populations of color are reported to have less participation in health education programs than other groups. Table 70 shows that although 22% of subjects did not know what could be done, 36% reported various types of personal methods to be employed, most of which would require face-to-face contact. Twenty-four percent of subjects felt offering some type of food would motivate women to participate in the program. Various types of incentives and media were also reported by a small percentage of subjects (eight and six percent, respectively). It should be noted here that subjects identified two different categories of information dissemination methods based on who was being targeted. For the community in general, print methods were recommended; for individuals, however, personal methods were suggested. This difference would need to be considered when planning and implementing a program.

Table 69

Nutrition Education Program Needs - Methods to Inform the Community

Method	%
Print	53
Flyers	28
Letters/Pamphlets/Newsletters in the mail	18
Posters/Signs	15
Personal	26
Go door-to-door around the community/Visit homes	7
Word-of-mouth/Neighbors talking to each other	6
Make phone calls	3
Have a nutrition introduction/cooking party/Serve food	3
Meetings to inform of nature, benefits and educational value of program	3
Be straight up with the people	2
Have a nutritionist come talk to the people	1
Media (television, radio, and advertisements)	8
Other	2
Don't know	15
No response	12

Note. n = 99. One subject did not answer this section. Percentages reflect multiple responses.

Table 70

Nutrition Education Program Needs - Methods to Promote Attendance

Method	%
Personal	36
Just come out and talk to the people/tell about it	12
Talk to the people about the importance of nutrition	6
Personal recruitment/invitation to come	5
Send flyers/letters/pamphlets to each resident	5
Go door-to-door around the community	4
Have neighbors tell neighbors to come	2
Other (tell of time and place, be friendly)	2
Food	24
Serve meals/Feed the people/Have refreshments	14
Distribute free/nutritious/needed foods	5
Show examples of nutritious foods/Let cook	5
Incentives (pay them, have door prizes, give gifts, offer something)	8
Media (TV, radio, advertisements, billboards, posters)	6
Other[a]	9
Don't know	22
No response	8

Note. n = 99. One subject did not answer this section. Percentages reflect multiple responses.

[a]Includes: conduct a survey, make it interesting, get the people motivated, notices in the rental office, be persistent, have a singing group, make referrals to the program based on reports from the health department on the health of the children.

Table 71 summarizes the primary information subjects felt needed to be addressed in a nutrition education program for this community. Thirty-one percent of subjects identified topics which were categorized as specific information regarding nutrition, foods and eating behaviors. This was as opposed to general nutrition and foods information (20%), which was classified as such if subjects just wrote the words "foods" or "nutrition." Information about general health principles and health problems was reported by 19% of subjects. Sixteen percent of subjects viewed topics related to food preparation, cooking, purchasing and costs as issues to be addressed.

Finally, subjects were asked to identify specific information they needed personally in order to improve their nutritional status and that of their families. Table 72 shows a broad range of personal information required by subjects. Although topic areas were similar to those listed in Table 71, their rank differed, once again reflecting the difference in subjects' perceptions of the "community" and themselves. Various forms of specific education and information (19%) and food preparation, cooking, purchasing and costs issues (17%) were the primary personal program needs identified by subjects. An additional 17% reported a wide range of other personal information needed. All other areas of need were identified by less than 10% of subjects; 19% did not know and 15% did not answer this question.

The information in this section provides a basic structural framework within which a nutrition education program for this community could be developed. It also demonstrates the population's ability to clearly articulate its expectations and recommendations for program development and implementation. With careful use of

Table 71

Nutrition Education Program Needs - Topic Areas for Community

Topic	%
Specific Nutrition, Foods, Eating Behaviors Information	31
Foods to be eaten and not eaten for a healthy/longer life	15
Better eating habits/ways to eat	4
Fat content of foods	4
Proper/Best foods for children	3
The importance/meaning of nutrition/food group groups	3
Lowering salt, fat, cholesterol, or sugar in the diet	3
How to learn more about nutrition	2
The nutritional value of foods	2
Food itself	2
General Nutrition/Foods Information	20
Health Information	19
Good/General health principles/Getting healthy	12
Health problems in general	4
Specific health problems or conditions	3
Other health information	3
Food Preparation/Cooking/Shopping/Costs Issues	16
How to prepare meals	5
Shopping in general/How to buy the right/best foods	4
Better menu planning/recipes	3
How to prepare healthy/nutritious foods inexpensively	3
Where to shop for inexpensive but nutritious foods	2
Making food stamps/dollars stretch	1
Other Information	8
Don't know	7
No response	10

Note. n = 99. One subject did not answer this section. Percentages reflect multiple responses.

Table 72

Nutrition Education Program Needs - Personal Nutrition Information Required

Topic	%
Education/Information	19
More information/written information (pamphlets, books)	7
Counseling/Someone to discuss with	5
Nutrition classes/programs	3
Specific materials (food groups chart, reminder list for dr. prescribed diet)	2
Food illustrations/demonstrations	2
Other information	3
Food Preparation/Cooking/Shopping/Costs Issues	17
Various ways to cook foods	5
How to prepare better balanced/more nutritious meals	4
Shopping for the right foods	2
How to budget/manage food stamps better	2
Making food stamps/dollars stretch	2
Other issues	4
Specific Nutrition and Foods Information	9
Foods high/low in fat, cholesterol, salt, or sugar	5
More information on specific nutrient/food items	5
Foods important to/best for the body	3
The content of certain foods	2
Specific Eating Behaviors	7
General Nutrition/Food Information	3
Other Information[a]	17
Don't know	19
No response	15

Note. n = 99. One subject did not answer this section. Percentages reflect multiple responses.

[a]Includes: need to learn everything or anything, already eat well or know what to do (but could learn more), willpower, the condition of my body, being with people who know what's going on.

information generated from this section, and throughout this study, a meaningful and successful nutrition education program could be designed, implemented and evaluated for this unique population.

VI. SUMMARY

This section presented the results of the procedures employed and information gathered to investigate nutrition knowledge, beliefs and dietary intake in a group of poor housing development women. The procedures for the development and administration of a valid and reliable instrument to measure the study variables were carefully delineated, with an emphasis on cultural and linguistic relevance. Characteristics of the population were outlined, noting the particular challenges of working with a housing development population. The specific level of nutrition knowledge, extent of nutrition beliefs, and dietary intake status in the population were reported. Recommendations of subjects were given regarding the development and implementation of a nutrition education program for this community. Finally, the various problems encountered and adjustments made throughout the study were thoroughly addressed in each section.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

I. SUMMARY

The purpose of this study was to delineate the process of investigating nutrition knowledge, beliefs and dietary intake in poor women, using the health belief model (HBM), as a basis for the development of a culturally relevant nutrition education program. The following issues and tasks were addressed:

1. The identification of a theoretical framework for investigating nutrition knowledge, beliefs and dietary intake in poor women.
2. The construction of a culturally relevant instrument to assess nutrition knowledge, beliefs and dietary intake in poor women.
3. The administration of a nutrition instrument to poor women in housing developments, including the selection and use of resident interviewers.
4. The identification of characteristics of poor women residing in housing developments which impact the research process.
5. A description of nutrition knowledge, beliefs and dietary intake patterns of poor women.
6. An exploration of associations between the HBM constructs and nutrition knowledge and dietary intake of poor women.

7. The identification of other relevant information required for developing a nutrition education program for poor women living in housing developments.

8. A description of obstacles encountered and adjustments required when investigating a housing development population.

The need for and significance of the study rested in the fact that few studies had addressed nutrition issues or utilized the (HBM) in the study population, and the increased susceptibility of the population to nutritional inadequacy and the nutrition-related disorders.

A valid and reliable instrument was developed to assess study variables. Judges in the fields of nutrition, health education, poor populations of color, and communication were utilized to establish content, cultural and linguistic validity of the knowledge and beliefs sections of the instrument. The instrument was pilot-tested in the study population, and revised based on judges' evaluations, researcher judgments, problems experienced in the field, and statistical analysis using the Kuder Richardson-21 formula (knowledge test) and Cronbach's alpha (beliefs scale).

A non-representative sample of 100 women was obtained for the study from a sampling frame consisting of all inhabited units in the four housing developments in the MLB section of Knoxville, TN. Criteria for participation were: 1) being 18 years of age or older; 2) a current resident of the housing development; and 3) the primary person responsible for food matters in the home.

Subjects were interviewed by either the personal or group interview method. Interviews were conducted by both the researcher and three trained resident interviewers. Subjects were interviewed on the following variables:

1. level of nutrition knowledge, using the Dietary Guidelines for Americans and 1990 Objectives for the Nation as the information base;
2. extent of nutrition beliefs, as measured through the six original constructs of the HBM - perceived susceptibility, seriousness, benefits, barriers, cues to action and general health motivation;
3. dietary intake, using a basic food frequency which emphasized the five food groups, other foods and basic dietary practices; and
4. other relevant information necessary for development of a nutrition education program.

Given the exploratory and descriptive nature of the study, major emphasis was placed on delineating the specific procedures required, problems encountered, and adjustments made when working within a housing development population.

II. FINDINGS

The various procedures described and results generated produced the following findings:

Theoretical Framework

1. The HBM was an appropriate theoretical framework for investigating nutrition knowledge, beliefs and dietary intake in poor women.

Instrumentation

2. A valid (per a panel of 24 judges) and reliable culturally appropriate instrument was developed to assess nutrition knowledge (KR-21 = .88) and nutrition beliefs (alpha = .90) in poor women. The dietary intake instrument, however, proved to be problematic.

Administration

3. A dual method of administration of the study instrument by personal and group interview was required to assess nutrition knowledge, beliefs and dietary intake in poor housing development women.
4. The use of unsupervised, resident interviewers was not highly effective for instrument administration and slowed the research process.

Population Characteristics

5. The housing development setting, and its residents, possessed unique characteristics which may potentially impact the research process. These included: concept difficulty in some sections of the instrument; semantic and interpretational differences; inability to make contact; a high percentage of unit vacancies; limited contact and interview hours; a high level of mistrust; and failure of subjects to follow through with participation commitments. The women, however, also exhibited a high interest in and concern for health and nutrition matters in general.

6. Housing development women exhibited below average knowledge in nutrition (69.5%). Knowledge levels were lowest for: foods in the other foods group; foods high in cholesterol; various general concepts related to the Guidelines; and associations between dietary patterns and the nutrition-related disorders. Conversely, they equalled or exceeded the general population and other populations in knowledge of some nutrition principles.

7. Housing development women exhibited strong positive perceptions regarding the following nutrition beliefs: a) personal susceptibility to and seriousness of selected nutrition-related disorders; b) perceptions of the benefits of developing and maintaining nutritional adequacy; and c) motivation toward nutrition and health matters. These beliefs were not uniform across all nutrition-related diseases and were less strong for general nutritional inadequacy. There also existed many perceived barriers to the development of optimal nutritional well-being, including: the taste and expense of nutritious foods, the ability to understand nutrition information, religious beliefs, lack of trust in health authorities, and lack of transportation for the purchase of inexpensive or nutritious foods. Cues to action was the only beliefs core which showed neither a strong positive or negative orientation.

8. Housing development women showed below average dietary intake for breads and cereals, the vegetable food group, and water, and average intake for the meats, milk and fruits food groups. A mixture of positive and negative dietary patterns were observed regarding current nutritional recommendations and guidelines.

HBM Associations

9. A moderate positive correlation was found between nutrition knowledge and beliefs, with the strongest relationships occurring between total knowledge and beliefs scores ($r = .53$), and the multiple choice section of the knowledge test and total beliefs ($r = .58$). Only one association existed between the HBM constructs and dietary intake: general health motivation and meat consumption ($X^2 = 16.62$, $p = <.003$).

Other Relevant Information

10. Regarding personal health status, housing development women exhibited: a) all of the nutrition-related disorders, with teeth problems, obesity, hypertension, diabetes, and heart disease being most prevalent; b) very strong misperceptions regarding personal level of obesity; and c) appropriate reported dietary changes for nutrition-related disorders, especially hypertension and diabetes.

11. Housing development women accurately perceived their personal level of nutrition knowledge, but were unable to clearly articulate the meaning of good nutrition and a nutrition problem.

12. Housing development women possessed varied perceptions regarding personal versus community nutrition problems, health status, and nutritional status.

13. Housing development women reported physicians and the WIC program as the primary sources of nutrition information. They, however, identified themselves as the primary factor which influences food purchasing and selection decisions.

14. Major food purchasing habits of housing development women included: a) a link between location of housing development residency and type of grocery store where primary food shopping occurred; b) the occasional use of food label reading during shopping for food selection; and c) an average monthly food expenditure of $210, using both cash and food stamps.

15. Food assistance programs in which housing development women participated were the food stamp program and the school lunch or breakfast program for children. About one fourth of women obtained emergency food assistance from a local community organization or multiple sources once or twice per month, largely because they either ran out of or low on food.

16. A nutrition education program for this community must consider the following environmental and social factors: availability of on-site meeting facilities and their location within the development; transportation to surrounding grocery stores; advocacy efforts at local grocery stores regarding the pricing and availability of nutritious foods; participation by physicians and local agencies for the support and delivery of the program; various personal and print information dissemination methods; time and day of scheduling; and a wide range of felt and identified nutritional needs.

Obstacles and Adjustments

17. Findings regarding the various obstacles encountered when investigating the housing development population are addressed in findings 2, 3, 4, 5, 7 and 12.

III. CONCLUSIONS

Based on the findings of this study, the following conclusions were made:

1. A theoretical framework is required for exploring nutrition issues in low socioeconomic populations of color.
2. The development of a culturally relevant instrument for a low socioeconomic population of color requires oversight by a researcher

of color and reviewers which either represent or understand the group being addressed.

3. The housing development population, as a hard-to-reach population, possesses many qualities which may necessitate a different research methodology and standard for measuring success.

4. The combined low level of nutrition knowledge, varied beliefs, and poor dietary patterns of housing development women indicate a strong need for nutrition education.

5. The broad range of other relevant information generated would support and enhance the development of a nutrition education program for housing development women.

IV. RECOMMENDATIONS

The following recommendations were made, based on the results, findings and conclusions of this study:

1. The dual method of instrument administration should be compared for validity of and contrast in responses among this population.

2. The current study should be replicated in a representative sample of housing development women, in order to allow for generalizability of results to other housing development populations.

3. The following methodological changes should be made when replicating this study, in order to create the best opportunity for

contacting and interviewing subjects. a) Contacters should be hired for the exclusive purpose of distributing flyers, making contacts, recruiting subjects and perpetually informing the community about the study; they should function prior to and throughout the duration of the study. b) Interviewers should work in teams, for safety and efficacy purposes. c) Two sets of interviewers are required for the dual administration method - one to conduct the group interviews and one to conduct the personal interviews; this would facilitate continuous and simultaneous interviewing, and impact the length of time required to cover each development. d) If the size of the development is large, it should be divided into sections, with contacters and interviewer teams working each section for several days before moving to the next division; this would saturate each area of the development and potentially increase participation. e) Also depending on the size of the development, the location of designated group meetings should be moved to various sites within the development, in order to reach and accommodate a larger number of residents, especially those who live in the peripheral sections of the development. f) Personal visits should be employed over a mailed letter to explain the purpose and nature of the study to sampled subjects. g) A mechanism should be devised for distribution of financial incentives on the same day the interview occurs; however,

distribution should be in a safe or guarded location to avoid potential injury to both subjects and interviewers.

4. Content for a nutrition education program for housing development women should be specific to the areas of low knowledge, alternative beliefs, and poor dietary patterns identified in the study. Particular attention should be given to the diet-disease associations - especially obesity, general and basic nutrition principles, appropriate consumption of the five food groups, identification of other foods, foods high in fat, cholesterol and sodium, and the meaning of proper nutrition.

5. Qualitative methods of health investigation need to be explored as potentially more effective research methods in the housing development population.

CHAPTER VI

EPILOGUE

An epilogue to an exhaustive document such as the one presented here would appear unnecessary. However, in light of the many obstacles faced and alterations required in this study, there are a few additional insights the researcher believes would be beneficial to future studies conducted in this population.

This study was very carefully structured initially as a first phase, prospective, analytic investigation of the HBM as a predictor of nutrition-related behavior. This diagnostic use of the HBM would then serve as a strong basis for nutrition education program development. Central to use of the HBM in this way is the ability to adequately document beliefs in the population prior to measuring behavior. On one level, this study has accomplished that. However, also key in this diagnostic approach is the development of HBM scales which accurately assess the various constructs according to the underlying theoretical assumptions. At the heart of this process is the use of factor analysis and multiple regression to establish both construct validity and predictive power of the scales. A necessary requirement for the use of any inferential statistic is the sample's ability to meet stringent underlying assumptions, with normality of the sample population being paramount. While the attainment of a relatively small and non-representative sample did not markedly alter the basic design of this study, it totally canceled the potential for analytic evaluation and generalizability of the results. If there is any disappointment in this work, it lies in

the fact that these results are not generalizable to other housing development populations.

This important concept raised many questions regarding both the research process as employed in low socioeconomic populations, as well as the standard measures of success regarding research procedures. On one very important level, this study was highly successful, generalizability aside. That 100 poor, disenfranchised women were willing to sit and talk for over an hour about nutrition and health matters at minimal pay is itself a great accomplishment. And yet, the researcher always hopes that what he or she finds will be beneficial not just to the population of study but to other similar groups as well. Thus, generalizability is critical.

Two specific issues related to this topic may need to be considered when conducting quantitative studies in the housing development population. First, in light of the wide range of problems, barriers and issues described in this work, true representativeness of this population may never be possible. Not reflected in the results is the fact that residents move from unit to unit within the developments with high frequency. Also, the higher than average level of mistrust, fear, substance abuse and inconsistency among residents and large number of vacant units may always produce a substantial percentage of sampled subjects who are unable to be contacted. Thus, possibly a new standard of representativeness needs to be established for this particular population or the assumption made that it may not be achievable. Given the homogeneity of this population, participation of subjects from either buildings versus

units or subdivisions of the development may be an adequate measure of representativeness.

Secondly, the differences between and among residents within the housing development population, even with a representative sample, may still prohibit generalization of results from one housing development to another, including those within the same community. The four developments studied here varied in size, location, age, and characteristics, as well as residents' attitudes and perceptions. For example, the interviewer at Lonsdale Homes rarely conducted a group interview, as most subjects preferred the personal interview method. These subjects were also most likely to indicate not wanting to be "bothered with" their neighbors. Western Heights residents, on the other hand, were more communal and had the highest percentage of group interviews, with half being conducted in residents' homes. College Hills had a largely mixed interview format, whereas, all of the interviews conducted in College Homes were held at the Tenants' Association building. In relation to the highly structured and precise instrument used in this study, the researcher obtained far more insight and information from both informal discussions with the women during the interview process and from the open-ended. questions in Section IV. Regarding the later, the most information was obtained during personal interviews, whereby the issues were fully discussed between the researcher and the subject. Group interview data for the open-ended questions generally yielded one line or one or two word phrases. Multiple research methods may, therefore, be required in this population in

order to obtain the most accurate and representative data. Such a format, however, may alter or taint "traditional" research processes.

In the opinion of this researcher, following this nearly three year work and based on other professional experiences, traditional, quantitative research designs may not be the most effective methods for studying health issues in unique, low socioeconomic populations of color. Perhaps more qualitative, ethnographic, oral and relational style methods might be more appropriate for and acceptable to these populations. The latter have been strongly recommended for use in health education programs. Possibly they should now be explored for use in health education research.

Another important issue is related to the scope of this research. It is apparent, both from the size of this document and the amount of information generated, that the overall scope of this study was probably too broad. Although not visibly apparent, the scope was also excessive given the time and financial constraints of the researcher. Scope is an important consideration here since housing development residents represent a relatively new population of study in health education research. In retrospect, this study really consisted of three focuses: 1) the identification of the structure, nature and characteristics of the housing development population which impact the health research process; 2) the development of a valid, reliable and culturally relevant instrument for assessing nutrition-related variables in a low socioeconomic population of color; and 3) the actual assessment of nutrition knowledge, beliefs and dietary intake in poor women of color using the HBM. Realistically, any one of these areas would have been a sufficient focus for a

dissertation study. However, few studies among poor populations of color show strong continuity of purpose, structure, implementation and analysis. Much research in these populations is fragmented and lacks a clear picture of the entire research process, from inception to analysis. In this regard, the work presented here is unique. While this researcher would not recommend that other fledgling researchers attempt a project of this magnitude, it is clear that more comprehensive research is required among these populations. The fact that this study became descriptive and exploratory rather than analytic is equally important. Given the unexplored nature of both the population and nutrition issues addressed, the study probably should have been structured from this perspective initially. But hindsight is always clearer than foresight, thus, the researcher strongly recommends that descriptive and exploratory studies be performed first among poor populations of color before attempting analytic investigations. This should be done especially when the population has not been well-studied, or where there is limited research in the selected health area on the population. And, while the survey design is not regarded as the most powerful research method, it is sorely needed in virtually every area of health education research for poor populations of color.

On a final note, this process has made the researcher even more suspicious of studies conducted among poor populations of color, particularly regarding methodology. The researcher's personal experiences as a poor person of color and training in working with such groups resulted in the application of extreme care and caution to every aspect of the project. Yet, even with this very high level of

sensitivity and awareness, major problems occurred. The research designs of studies conducted among poor populations of color, especially procedures employed, must be scrutinized carefully to ensure that the often negatively reported results are not merely the result of a "disinterested" or "hard-to-reach" population.

It is the sincere hope of this researcher that the trail blazed and insights given throughout this work will serve as a guide for other researchers who dare to enter the conflictive yet challenging world of health research among the disadvantaged.

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APPENDICES

APPENDIX A

JUDGES INFORMATION

SAMPLE LETTER OF INVITATION TO JUDGES

December 3, 1990

Deborah A. Fortune, Ph.D.
Assistant Professor of Health Education
University of North Carolina at Charlotte
Department of Health and Physical Education
Charlotte, NC 28223

Dear Dr. Fortune

My name is Carolyn Parks. I am a doctoral candidate in health education at the University of Tennessee. My research project is an investigation of nutrition knowledge, beliefs, and dietary intake in poor African-American and white women, using the Health Belief Model. The information will be used as a basis for developing a culturally relevant nutrition education program for this population.

I am writing to request that you serve as a judge for the validation of the nutrition beliefs scale to be used in the study. You are being approached for your expertise in one or more of the following areas: nutrition or nutrition education research; health education research or program development; use of the Health Belief Model; or health education research or program development for poor and minority populations. Your assistance is considered invaluable to this project.

Enclosed is a copy of the scale with background information and directions. The instrument was developed at a 5th - 6th grade level to accommodate the low literacy needs of the population. It also reflects linguistic and cultural appropriateness in phrasing and sentence structure. Finally, attempts were made to eliminate as much technical jargon as possible, while preserving the accuracy of the intended content areas.

I have enclosed a self-addressed stamped envelop for your convenience. The completion and return of the instrument at your earliest convenience would be greatly appreciated.

Thank you kindly for your assistance in this matter.

Sincerely,

Carolyn P. Parks, M.S.

JUDGE INFORMATION

This information is requested in order to properly acknowledge your participation in this project.

NAME:

_____

INSTITUTION:

_____

TITLE:

_____

ADDRESS:

_____

_____

SAMPLE THANK YOU LETTER TO JUDGES

February 8, 1991

Moses Goldmon, M.S.
Graduate Teaching Associate
The University of Tennessee at Knoxville
Department of Health, Leisure and Safety
1914 Andy Holt Avenue
Knoxville, TN 37996-2700

Dear Mr. Goldmon:

This letter is to thank you for returning my nutrition instrument and offering suggestions for its improvement. Your participation in this project has been invaluable. I greatly appreciate you taking time out of your busy schedule to respond to such a lengthy instrument.

The instrument is currently being revised and will be pilot tested with the study population. If you desire additional information on this study or a copy of the completed instrument, please contact me at the above new address, as I am no longer at the University of Tennessee.

Once again, thanks for your assistance with this project.

Sincerely,

Carolyn P. Parks, M.S.

BACKGROUND INFORMATION ON THE KNOWLEDGE TEST

SECTION I: NUTRITION KNOWLEDGE TEST

BACKGROUND: This instrument is designed to measure selected general nutrition knowledge and knowledge of dietary factors associated with nutrition-related disorders. The body of information used to develop and select test items was the Dietary Guidelines for Americans and the public awareness objectives of the 1990 Objectives for the Nation. These were viewed as the two primary bases of current nutrition information, education, and advice. The scope of the test was not intended to be comprehensive of the vast spectrum of nutrition information. Rather, it reflects some of the basic information required by an individual to understand the Guidelines and Objectives. This focus was deemed appropriate based on preliminary observations made in the community, which indicated residents had limited or incorrect knowledge of basic nutrition issues, such as the five food groups, cholesterol, caloric value of foods, vitamin supplements and requirements, food preparation, and weight control. Items were either selected from existing instruments or developed to reflect the principle components of the Guidelines or Objectives. Knowledge of four additional diet-related disorders not listed in the Objectives was also assessed. The instrument has a 5th-6th grade level of readability (Fry) and will be administered by personal interview.

DIRECTIONS: For each item, please evaluate its appropriateness against the listed guideline or objective, which appears at the beginning of each section of questions. Make your evaluations using the following rating scale:

SF = strongly favorable
F = favorable
UD = undecided
UF = unfavorable
SUF = strongly unfavorable

In addition, alter any statements you feel need adjustment, and add any statements you think should be included.

SAMPLE OF KNOWLEDGE TEST ITEMS AS SENT TO JUDGES

DIETARY GUIDELINES

Eat a Variety of Foods.

1. The best way to get a well-balanced diet is to:

   a. eat only certain types of foods
   b. eat many different kinds of foods
   c. take a vitamin pill every day
   d. eat a lot of meat
   e. don't know

   SF_____ F_____ UD_____ UF_____ SUF_____

2. Which of these is not one of the four food groups?

   a. fruits and vegetables
   b. breads and cereals
   c. protein and fat
   d. milk
   e. don't know

   SF_____ F_____ UD_____ UF_____ SUF_____

3. How many servings of fruits and vegetables should an adult eat every day?

   a. 2
   b. 3
   c. 4
   d. 5
   e. don't know

   SF_____ F_____ UD_____ UF_____ SUF_____

4. How many servings of breads and cereals should an adult eat every day?

   a. 2
   b. 3
   c. 4
   d. 5
   e. don't know

   SF_____ F_____ UD_____ UF_____ SUF_____

BACKGROUND INFORMATION ON THE BELIEFS SCALE

SECTION II: NUTRITION BELIEFS SCALE

BACKGROUND: This instrument is designed to measure nutrition beliefs using six constructs of the Health Belief Model (HBM). The constructs are operationalized according to Rosenstock (1974) and Becker (1974). These constructs were considered appro-priate since the HBM has not been extensively applied to the area of nutrition. Statements were either adapted from existing valid and reliable instruments to reflect the area of nutrition, or developed as needed. Response choices are on a five-point Likert scale from "really agree" (5) to "really disagree." The instrument has a 5th-6th grade level of readability (Fry) and will be administered through a personal interview. For ease of evaluation, information which will appear in the final interview guide (directions, prompts, etc.) have been deleted.

DIRECTIONS: For each subscale, please evaluate the appropriateness of each statement against the listed construct, which appears at the beginning of each subscale. Make your evaluations using the following rating scale:

SF = strongly favorable
F = favorable
UD = undecided
UF = unfavorable
SUF = strongly unfavorable

In addition, alter any statements you feel need adjustment, and add any statements you think should be included.

SAMPLE BELIEFS SCALE ITEMS AS SENT TO JUDGES

PERCEIVED SUSCEPTIBILITY

1. Based on what I eat and drink, I have a poorer diet than other people.

   SF_____ F_____ UD_____ UF_____ SUF_____

2. As long as the doctor doesn't say anything to me about nutrition, I don't think I need to worry about it.

   SF_____ F_____ UD_____ UF_____ SUF_____

3. If I don't eat right, I won't get all the nutrients my body needs.

   SF_____ F_____ UD_____ UF_____ SUF_____

4. I don't believe you can get sick from not eating right.

   SF_____ F_____ UD_____ UF_____ SUF_____

5. I can't have a poor diet because I take vitamin pills.

   SF_____ F_____ UD_____ UF_____ SUF_____

6. Having a poor diet is not something I think about.

   SF_____ F_____ UD_____ UF_____ SUF_____

7. I won't get health problems like heart disease, cancer or diabetes because I eat right.

   SF_____ F_____ UD_____ UF_____ SUF_____

8. I believe in God, so I won't get health problems like heart disease, cancer or diabetes.

   SF_____ F_____ UD_____ UF_____ SUF_____

9. I have more of a chance of getting some health problems than others. (Which problems?)

   SF_____ F_____ UD_____ UF_____ SUF_____

JUDGES FOR THE NUTRITION KNOWLEDGE TEST

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APPENDIX B

THE ORIGINAL STUDY INSTRUMENT

NUTRITION EDUCATION SURVEY QUESTIONNAIRE

SECTION I: NUTRITION KNOWLEDGE TEST

DIETARY GUIDELINES

Eat a Variety of Foods.

1. The best way to get a well-balanced diet is to:

   a. eat only certain types of foods
   b. eat many different kinds of foods
   c. take a vitamin pill every day
   d. eat a lot of meat
   e. don't know

2. Which of these is not one of the four food groups?

   a. fruits and vegetables
   b. breads and cereals
   c. protein and fat
   d. milk
   e. don't know

3. How many servings of fruits and vegetables should an adult eat every day?

   a. 2
   b. 3
   c. 4
   d. 5
   e. don't know

4. How many servings of breads and cereals should an adult eat every day?

   a. 2
   b. 3
   c. 4
   d. 5
   e. don't know

5. How many servings of milk or milk products should an adult eat every day?

   a. 1
   b. 2
   c. 3
   d. 4
   e. don't know

6. How many servings of meat should an adult eat each day?

   a. 1
   b. 2
   c. 3
   d. 4
   e. don't know

7. Which of these foods belong to the fruit and vegetable group?

   a. cereal and rice
   b. greens and pears
   c. hot dogs and beans
   d. cheese and yogurt
   e. don't know

8. Which of these foods belong to the bread and cereal group?

a. spaghetti and rolls
b. pudding and cheese
c. string beans and peas
d. bologna and sausage
e. don't know

9. Which of these foods belong to the meat group?

a. pork chops and ham
b. cucumbers and lettuce
c. macaroni and oatmeal
d. buttermilk
e. don't know

10. Which of these foods belong to the milk group?

a. bread and pancakes
b. onions and okra
c. eggs
d. ice cream and yogurt
e. don't know

11. Which of these groups of foods could be used in place of meat?

a. eggs, peanut butter, and black-eyed peas
b. milk, butter, and margarine
c. waffles, muffins, and grits
d. potatoes, rice, and cereal
e. don't know

12. Which of these foods has the most vitamin A?

a. cauliflower
b. green beans
c. sweet potatoes
d. corn
e. don't know

13. Which of these foods has the most vitamin C?

a. apples
b. bananas
c. peaches
d. oranges
e. don't know

14. Which of these foods has a lot of calcium?

a. peanut butter and eggs
b. tomatoes and peas
c. milk and cheese
d. grapes and peaches
e. don't know

Maintain Desirable Weight.

15. Which of these list of foods should a person eat less of if they want to stay the same weight or lose weight?

a. oranges, bananas, carrots, and greens
b. potato chips, candy, and soda pop
c. potatoes, macaroni, and bread
d. black-eyed peas and rice
e. don't know

16. Which of these lists of foods would not be good for a person to eat if they want to lose weight?

a. low fat yogurt and skim milk
b. lean pork and beef
c. butter and fried foods
d. chicken and fish
e. don't know

Avoid Too Much Fat, Saturated Fat, and Cholesterol.

17. Saturated fat is a type of fat found mostly in:

a. animal foods
b. vegetable foods
c. bread foods
d. vegetable oil
e. don't know

18. Which foods have a lot of saturated fat in them?

a. lard, butter, fried foods
b. corn bread and crackers
c. cottage cheese and skim milk
d. fish and turkey
e. don't know

19. Cholesterol is a type of fat found in:

a. animal foods
b. vegetable foods
c. bread foods
d. vegetable oil
e. don't know

20. Which foods have a lot of cholesterol in them?

a. eggs, liver, and shrimp
b. chicken, fish, and turkey
c. jello, sherbet, and coffee
d. greens, whole wheat bread, margarine
e. don't know

21. The best way to tell how much fat and cholesterol are in a food product is to:

a. taste the food
b. look at the food
c. read the food label
d. you can't really tell
e. don't know

22. Which one of these ways of cooking chicken would have the highest amount of fat?

a. frying it
b. baking it
c. broiling it
d. boiling it
e. don't know

Eat Foods with Adequate Starch and Fiber.

23. Most of the food in your diet should come from eating foods which are high in:

a. protein
b. carbohydrate
c. vitamins and minerals
d. fat
e. don't know

24. Which list of foods does not have carbohydrate foods in it?

a. nuts, peas, beans
b. breads and cereals
c. fruits and vegetables
d. meat and fish
e. don't know

25. Starches like potatoes, rice, macaroni and spaghetti are examples of:

a. good carbohydrate foods
b. bad carbohydrate foods
c. protein foods
d. fattening foods
e. don't know

26. The part of plant foods which cannot be broken down by the body is called:

a. protein
b. fiber
c. starch
d. fat
e. don't know

Avoid too much Sugar.

27. The best way to tell how much sugar is in a food product is to:

a. read the food label
b. taste the food
c. look for sugar on the food
d. you can't really tell
e. don't know

28. Sugar comes in many forms. Which of these is another form of sugar?

a. molasses
b. corn syrup
c. honey
d. all of these are other forms of sugar
e. don't know

Avoid too much Sodium.

29. Another name for salt is:

a. potassium
b. sodium
c. selenium
d. calcium
e. don't know

30. Which of these is not be a good seasoning to use instead of salt?

a. lemon juice
b. spices
c. onion or garlic salt
d. herbs
e. don't know

31. The best way to tell how much salt is in a food product is to:

a. taste the food
b. look for salt on the food
c. read the food label
d. you can't really tell
e. don't know

If You Drink Alcohol, Do So in Moderation.

32. Drinking a moderate amount of beer or wine means a person will drink:

a. 1 or 2 drinks a day
b. 3 or 4 drinks a day
c. 5 or 6 drinks a day
d. 7 or 8 drinks a day
e. don't know

33. Drinks like beer and wine are:

a. high in calories and low in nutrients
b. a good source of nutrition
c. good for your body
d. good for the stomach's sake
e. don't know

OBJECTIVES

Major Foods Low in Fat and Sodium, High in Calories and Sugar, and Good Sources of Fiber.

34. The foods that have the most fat in them are:

a. skim milk and cottage cheese
b. grapes and potatoes
c. bread and cereal
d. hamburgers and whole milk
e. don't know

35. Which of these foods is low in fat?

a. macaroni and spaghetti
b. ice cream
c. boiled ham
d. Velvetta cheese
e. don't know

36. Which of these foods has a lot of salt in them?

a. TV dinners and pot pies
b. snow peas
c. green peppers and onions
d. collard and turnip greens
e. don't know

37. Which of these foods do not have a lot of salt in them?

a. soups and stews in a can
b. potato chips, pretzels and corn chips
c. fresh fruits and vegetables
d. bacon, hot dogs and lunch meats
e. don't know

38. Which list of foods has the most calories?

a. rice, spaghetti, and macaroni
b. fried chicken, cakes, and pies
c. black-eyed peas, pinto beans, lima beans
d. lean pork or beef
e. don't know

39. Which of these foods gives a lot of calories but not very many vitamins and minerals?

a. chicken
b. strawberries
c. candy
d. sweet potatoes
e. don't know

40. Which of these foods is not a high calorie food?

a. 4 cookies
b. 1 plain baked potato
c. 10 potato chips
d. 1 small steak
e. don't know

41. Which of these foods would have a lot of sugar in it?

a. breakfast cereals like Trix and Cap'n Crunch
b. oatmeal
c. grits
d. biscuits
e. don't know

42. Which of these foods would have a lot of sugar in it?

a. cheese
b. tomatoes
c. crackling bread
d. catsup and barbecue sauce
e. don't know

43. The foods that have the most sugar in them are:

a. potato chips and pretzels
b. sweet potatoes
c. rolls and muffins
d. cookies and cakes
e. don't know

44. Which of these foods does not have a lot of fiber?

a. fruits and vegetables
b. chicken and fish
c. beans and peas
d. whole wheat breads and cereals
e. don't know

Weight Loss Principles.

45. The best way to lose weight in the long run is to:

a. stop eating potatoes and bread
b. eat one meal a day
c. exercise and eat less calories
d. go on the kind of diet Oprah Winfrey did
e. don't know

46. Which of these ways of losing weight is the best way?

a. use Slim Fast
b. don't eat foods like macaroni and rice
c. take laxatives
d. eat less calories
e. don't know

47. Which of these ways of losing weight is the best way?

a. do more exercise
b. take water pills
c. take diet pills
d. go on the Dick Gregory diet
e. don't know

Suspected Diet-Disease Links for Nutrition-Related Disorders.

(GENERAL)

48. Which one of these is not a disease related to nutrition?

a. heart trouble
b. pneumonia
c. diabetes
d. high blood pressure
e. don't know

49. Which one of these is not a health problem related to nutrition?

a. teeth problems
b. arthritis
c. cancer
d. overweight
e. don't know

(HEART DISEASE)

50. A person's chance of having a heart attack is higher if they have a:

a. high blood cholesterol level
b. high blood count
c. low blood cholesterol level
d. low blood sugar level
e. don't know

51. Which of these diet habits might lower a person's chance of having a heart attack?

a. eating less fatty foods
b. eating less starchy foods
c. eating less sugar foods
d. eat more garlic
e. don't know

52. The build up of plaque in the heart's vessels comes from eating foods that are high in:

a. protein
d. cholesterol and fat
c. sugar
d. salt
e. don't know

(HIGH BLOOD PRESSURE AND STROKE)

53. People who have high blood pressure can make it worse by eating foods too high in:

a. salt
b. sugar
c. fat
d. pork
e. don't know

54. Which of these health problems might be related to eating too much salt?

a. diabetes
b. arthritis
c. stroke
d. cancer
e. don't know

(OSTEOPOROSIS)

55. Which of these diseases come from not eating enough foods like milk and cheese?

a. diabetes
b. heart trouble
c. high blood pressure
d. bone disease
e. don't know

(CANCER)

56. Which of these diet habits would help to prevent you from getting cancer?

a. eating foods high in fiber
b. eating foods low in minerals
c. eating foods low in protein
d. eating foods low in sugar
e. don't know

57. Which of these diet habits would help to prevent you from getting cancer?

a. eating foods high in protein
b. eating foods high in calcium
c. eating foods lower in fat
d. eating foods lower in protein
e. don't know

58. Which of these vegetables might help prevent you from getting cancer?

a. potatoes and string beans
b. tomatoes and lettuce
c. cabbage and broccoli
d. okra and celery
e. don't know

59. If a person wants to prevent getting cancer, which of these foods should they not eat:

a. lunch meats, hot dogs, and bacon
b. chicken and turkey
c. potatoes and macaroni
d. fish
e. don't know

60. Fiber is important in your diet because it helps to keep you from:

a. getting arthritis
b. getting gout
c. getting bladder trouble
d. being constipated
e. don't know

(DENTAL)

61. The main health problem caused by eating too many sugar foods is:

a. diabetes
b. cancer
c. cavities
d. heart trouble
e. don't know

(CIRRHOSIS)

62. Which of these health problems could come from drinking a lot of beer and wine?

a. bone trouble
b. liver trouble
c. kidney trouble
d. heart trouble
e. don't know

(DIABETES)

63. A major cause of diabetes is:

a. eating too much sugar
b. eating too much fat
c. eating too many starches
d. being overweight
e. don't know

(OBESITY)

64. Which of these health problems could you get from being overweight?

a. heart trouble
b. high blood pressure
c. diabetes
d. you could get any of these if you are overweight
e. don't know

65. Which of these foods or drinks would not make you gain weight if you eat or drink a lot of them?

a. foods high in sugar
b. beer and wine
c. fruits and vegetables
d. foods high in fat
e. don't know

SECTION II: NUTRITION BELIEFS SCALE

PERCEIVED SUSCEPTIBILITY

Construct: **The perceptions of the individual regarding personal vulnerability to nutritional inadequacy and nutrition-related diseases.**

		RA	A	US	D	RD
1.	Based on what I eat and drink, I have a poorer diet than other people.	5	4	3	2	1
2.	As long as the doctor doesn't say anything to me about nutrition, I don't think I need to worry about it.	5	4	3	2	1
3.	If I don't eat right, I won't get all the nutrients my body needs.	5	4	3	2	1
4.	I don't believe you can get sick from not eating right.	5	4	3	2	1
5.	I can't have a poor diet because I take vitamin pills.	5	4	3	2	1
6.	Having a poor diet is not something I think about.	5	4	3	2	1
7.	I won't get health problems like heart disease, cancer or diabetes because I eat right.	5	4	3	2	1
8.	I believe in God, so I won't get health problems like heart disease, cancer or diabetes.	5	4	3	2	1
9.	I have more of a chance of getting some health problems than others. (Which problems?) _____	5	4	3	2	1
10.	It is very likely that I will get heart trouble.	5	4	3	2	1
11.	You can't get heart trouble from eating fatty foods.	5	4	3	2	1
12.	Eating high cholesterol foods could give me heart trouble.	5	4	3	2	1
13.	There is a good chance that I will get cancer one day.	5	4	3	2	1

		RA	A	US	D	RD
14.	Eating foods like bran cereal and cabbage has nothing to do with cancer.	5	4	3	2	1
15.	I worry a lot about getting high blood pressure.	5	4	3	2	1
16.	I could get high blood pressure if I eat too much salt.	5	4	3	2	1
17.	I have a good chance of having a stroke one day.	5	4	3	2	1
18.	My chances of getting diabetes are very low.	5	4	3	2	1
19.	I eat a lot of sugar foods, so I might get diabetes.	5	4	3	2	1
20.	If I am overweight, I could get diabetes.	5	4	3	2	1
21.	I am concerned about being or becoming overweight.	5	4	3	2	1
22.	If I eat too many foods high in fat and sugar, they could make me overweight.	5	4	3	2	1
23.	I feel that as long as I am at the right weight, I don't have to worry about good nutrition.	5	4	3	2	1
24.	I do not feel I can ever get bone disease.	5	4	3	2	1
25.	If I don't eat enough foods like milk and cheese, I might hurt my bones and teeth.	5	4	3	2	1
26.	Having problems with my teeth is not something I think about much.	5	4	3	2	1
27.	If I eat a lot of sweet foods, I could have problems with my teeth.	5	4	3	2	1
28.	I probably will never have liver problems.	5	4	3	2	1
29.	Drinking a lot of beer and wine could cause problems with my liver.	5	4	3	2	1

PERCEIVED SERIOUSNESS

Construct: **The individual's beliefs about the seriousness of nutritional inadequacy and various nutrition-related disorders. Perceptions may include evaluations of either medical or clinical consequences (e.g., death disability, or pain) or possible social consequences (e.g., effects of the condition on work, family life, and social relationships.**

		RA	A	US	D	RD
1.	Nutrition is important and one should not be careless about it.	5	4	3	2	1
2.	I don't believe bad nutrition is that serious because I know a lot of people who eat anything they want and never get sick.	5	4	3	2	1
3.	A bad diet could interfere with my life.	5	4	3	2	1
4.	If I don't get the right amount of vitamins and minerals, I could get sick.	5	4	3	2	1
5.	If I had a poor diet, it would make me feel bad.	5	4	3	2	1
6.	Having a bad diet could keep me from having relatives or friends over to eat.	5	4	3	2	1
7.	A bad diet could affect my work or daily activities.	5	4	3	2	1
8.	Some health problems are more serious than others. (Which ones?) _____	5	4	3	2	1
9.	The thought of getting heart trouble scares me.	5	4	3	2	1
10.	High blood pressure is not that serious because it can't kill you.	5	4	3	2	1
11.	Having a stroke would change my life forever.	5	4	3	2	1
12.	If I ever got cancer, it would probably hurt a lot.	5	4	3	2	1
13.	Being overweight is not that important, as long as you carry your weight well.	5	4	3	2	1
14.	Getting bone disease is not too serious a health problem.	5	4	3	2	1
15.	Problems with my teeth are not as serious as other health problems.	5	4	3	2	1

		RA	A	US	D	RD
16.	Liver problems are not that big of a problem.	5	4	3	2	1
17.	I think I could live with any problems I would have from getting diabetes.	5	4	3	2	1
18.	Eating lots of foods like broccoli and whole wheat is not that important.	5	4	3	2	1
19.	Having too much sugar in my diet is not as serious as having too much salt.	5	4	3	2	1
20.	Sweet foods can be bad for your health.	5	4	3	2	1
21.	I shouldn't eat a whole lot of salty foods or use too much salt because it could hurt my health.	5	4	3	2	1
22.	Eating foods high in cholesterol is not a serious health matter.	5	4	3	2	1
23.	Fried foods can be bad to my heart.	5	4	3	2	1
24.	I don't think drinking too much beer or wine could lead to health problems.	5	4	3	2	1

PERCEIVED BENEFITS

Construct: **The individual's beliefs about the benefits of sound nutrition and nutritional practices in preventing nutritional inadequacy and nutrition-related disorders. Beliefs are related to the perceived feasibility and effectiveness of the health recommendation in reducing susceptibility to and severity of the health problem.**

		RA	A	US	D	RD
1.	Eating many different kinds of foods would give me a balanced diet.	5	4	3	2	1
2.	Having a good diet really doesn't matter because you're going to die from something anyway.	5	4	3	2	1
3.	Having a good diet would not help me to live longer.	5	4	3	2	1
4.	Having a good diet would give me more energy.	5	4	3	2	1
5.	Having a good diet would improve my family's health.	5	4	3	2	1

		RA	A	US	D	RD
6.	A good diet is a major factor in preventing diseases.	5	4	3	2	1
7.	If I changed my eating habits it probably would not help me.	5	4	3	2	1
8.	Having a good diet is something a person must do no matter hard it is.	5	4	3	2	1
9.	I have little to gain by having a proper diet.	5	4	3	2	1
10.	I believe that a good diet is a major factor for keeping good health.	5	4	3	2	1
11.	If I eat less fatty foods, it could stop me from getting heart trouble.	5	4	3	2	1
12.	Eating foods with less cholesterol could stop me from getting heart trouble.	5	4	3	2	1
13.	If I ate less salty foods or used less salt, I could prevent or control high blood pressure.	5	4	3	2	1
14.	If I ate less salty foods or used less salt, it would prevent me from having a stroke.	5	4	3	2	1
15.	If I eat more vegetables like broccoli and cabbage, it might help me not get cancer.	5	4	3	2	1
16.	If you're going to get cancer, eating foods with a lot of vitamins C and A won't help.	5	4	3	2	1
17.	Eating more whole grain foods like wheat bread, bran cereals, and nuts could prevent cancer.	5	4	3	2	1
18.	If I ate more fresh fruits and vegetables, I could control my weight or lose weight.	5	4	3	2	1
19.	Losing weight would not help my heart work better.	5	4	3	2	1
20.	Being at the right weight has nothing to do with preventing or controlling diabetes.	5	4	3	2	1
21.	Eating a balanced diet can help control diabetes.	5	4	3	2	1
22.	Drinking less alcohol won't help me to prevent liver problems.	5	4	3	2	1

		RA	A	US	D	RD
23.	There is nothing I can do to stop myself from getting bone disease.	5	4	3	2	1
24.	Even if I ate less sweet foods, I could still get cavities.	5	4	3	2	1
25.	Eating less foods that come in cans, boxes or packages would lower the amount of salt and sugar I take in.	5	4	3	2	1
26.	If I read food labels when I shop,I could pick foods that are the best for my health.	5	4	3	2	1
27.	Cooking in different ways, like baking foods instead of frying them, would lower the amount of fat in my diet.	5	4	3	2	1

PERCEIVED BARRIERS

Construct: **The individual's beliefs about the negative aspects (barriers and costs) of developing and maintaining sound nutritional practices. Barriers may be viewed as inconvenient, expensive, unpleAsant, painful, or upsetting.**

		RA	A	US	D	RD
1.	I can't afford to have a good diet. It's too expensive.	5	4	3	2	1
2.	It is cheaper for me to eat canned vegetables and fruits instead of fresh ones.	5	4	3	2	1
3.	The foods that would help me have a good diet are too expensive in the store where I do most of my shopping.	5	4	3	2	1
4.	The grocery store where I do most of my food shopping does not sell the kinds of foods I need to have a good diet.	5	4	3	2	1
5.	I can't get to a grocery store where I could buy good and cheaper foods because I don't have transportation.	5	4	3	2	1
6.	I know where to shop for good foods.	5	4	3	2	1
7.	I don't know how to shop for good foods.	5	4	3	2	1
8.	When it comes to having a good diet, I don't know what to do or where to start.	5	4	3	2	1

		RA	A	US	D	RD
9.	I don't know where to go to get nutrition information.	5	4	3	2	1
10.	There are many places in my community where I can go to learn about nutrition.	5	4	3	2	1
11.	I have no one to help me learn about nutrition.	5	4	3	2	1
12.	Eating a proper diet would mean starting a new habit, which is hard to do.	5	4	3	2	1
13.	Foods that are suppose to be good for you don't taste as good as the foods I eat every day.	5	4	3	2	1
14.	Cooking with less salt makes my food taste different.	5	4	3	2	1
15.	Cooking with oil instead of lard or butter does not taste as good.	5	4	3	2	1
16.	Meats don't taste as good if they are baked or boiled instead of fried.	5	4	3	2	1
17.	Baking or broiling meats instead of frying them is too hard to learn to do.	5	4	3	2	1
18.	I have a hard time figuring out or understanding nutrition information.	5	4	3	2	1
19.	I know how to read the labels on foods.	5	4	3	2	1
20.	I don't understand the labels on foods.	5	4	3	2	1
21.	It takes too much time to fix foods in a nutritious manner.	5	4	3	2	1
22.	I wish I had time to learn more about nutrition and the foods I need to eat.	5	4	3	2	1
23.	Having a good diet is more trouble than it's worth.	5	4	3	2	1
24.	I can't eat as well as I could because I don't have good storage space in my house.	5	4	3	2	1
25.	It would be too hard to change the way I eat in my house.	5	4	3	2	1

		RA	A	US	D	RD
26.	My family would make fun of me if changed the way I eat.	5	4	3	2	1
27.	My family would like it if I made changes in our diet.	5	4	3	2	1
28.	I don't trust what doctors and other health people say about nutrition.	5	4	3	2	1
29.	Community health programs, including nutrition ones, are used by the government to spy on people.	5	4	3	2	1
30.	I believe all the talk about diet is just a trick to get people to spend their money.	5	4	3	2	1

CUES TO ACTION

Construct: **Stimuli which serve to trigger an individual's action regarding nutrition-related behavior.**

		RA	A	US	D	RD
1.	If I got a certain health problem or disease, I would change the way I now eat to help control the problem. (Which problem?) _____	5	4	3	2	1
2.	I eat right because it is good for my health.	5	4	3	2	1
3.	Nothing could make me change the way I now eat.	5	4	3	2	1
4.	If a relative got a certain health problem or disease, I would change the way I now eat to prevent me from getting the problem. (Which problem?)_____	5	4	3	2	1
5.	If one of my relatives gave me advice about nutrition, I would listen to them.	5	4	3	2	1
6.	I would change the way I now eat if one of my friends got a certain health problem or disease. (Which problem?)_____	5	4	3	2	1
7.	If a friend gave me advice about nutrition, I would use it.	5	4	3	2	1
8.	I listen to what my minister says about nutrition.	5	4	3	2	1

		RA	A	US	D	RD
9.	Seeing something on TV would make me change things in my diet.	5	4	3	2	1
10.	TV or radio commercials help me know what is good and bad nutrition.	5	4	3	2	1
11.	I would change things in my diet because of something I heard on the radio.	5	4	3	2	1
12.	I learn what is good and bad nutrition from reading labels on food packages.	5	4	3	2	1
13.	Something I read in a newspaper helped me eat better.	5	4	3	2	1
14.	I read something in a magazine that helped me learn about nutrition.	5	4	3	2	1
15.	I read a health pamphlet which helped me learn about nutrition.	5	4	3	2	1
16.	I learned about nutrition from reading different books.	5	4	3	2	1
17.	I went to a class or talk which helped me learn more about nutrition.	5	4	3	2	1
18.	I would make changes in the way I now eat if my doctor told me to.	5	4	3	2	1
19.	I could learn about nutrition if a nurse or counselor at a hospital or clinic showed me what to do.	5	4	3	2	1
20.	If I had more money to spend on food, I would probably eat a little better.	5	4	3	2	1

GENERAL HEALTH MOTIVATION

Construct: The individual's concern about and motivation for health matters in general.

		RA	A	US	D	RD
1.	Good health is an important part of life.	5	4	3	2	1
2.	I do very little to improve my health.	5	4	3	2	1
3.	I am doing a very good job of taking care of my health right now.	5	4	3	2	1

		RA	A	US	D	RD
4.	I am not that concerned about my health.	5	4	3	2	1
5.	Other things are more important to me than health matters.	5	4	3	2	1
6.	I think about my health a lot.	5	4	3	2	1
7.	I get at least 7-8 hours of sleep each night.	5	4	3	2	1
8.	I don't think about eating nutritious foods throughout the day.	5	4	3	2	1
9.	I eat a well-balanced diet.	5	4	3	2	1
10.	I take vitamins when I don't eat right.	5	4	3	2	1
11.	I exercise (walk, run, ride a bike) at least 3 times a week.	5	4	3	2	1
12.	Keeping one's weight down is important to health.	5	4	3	2	1
13.	Controlling stress is important to staying healthy.	5	4	3	2	1
14.	A person should not smoke if they want to stay healthy for a long time.	5	4	3	2	1
15.	Drinking a lot of beer and wine is not dangerous to a person's health.	5	4	3	2	1
16.	I always follow the doctor's orders because I believe they will help my health.	5	4	3	2	1
17.	I get a physical exam every year, in addition to seeing the doctor for illnesses.	5	4	3	2	1
18.	I get a dental exam every year, in addition to seeing the dentist for a problem.	5	4	3	2	1
19.	I search for new information related to my health.	5	4	3	2	1
20.	If you don't know anything about nutrition, you can't make wise food choices.	5	4	3	2	1

SECTION III. DIETARY INTAKE QUESTIONNAIRE

PERSONAL INFORMATION, HABITS

1. When were you born? ___/___/___ (Month Day Year)
2. How old are you? ___ years
3. Sex: 1 __ Male 2 __ Female
4. Race or ethnic background:
   1 __ White, not of Hispanic origin
   2 __ Black, not of Hispanic origin
   3 __ Hispanic
   4 __ American Indian/Alaskan native
   5 __ Asian
   6 __ Pacific Islander
5. Please circle the highest grade in school you have completed:
   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16+
6. What is your marital status? 1 __ Single 2 __ Married 3 __ Widowed 4 __ Divorced/Separated
7. How many times have you moved or changed residences in the last ten years? ___ times
8. Have you smoked at least 100 cigarettes in your entire life? 1 __ No 2 __ Yes If Yes,

   IF YES: About how old were you when you first started smoking cigarettes fairly regularly?
   ___ years old
   On the average of the entire time you smoked, how many cigarettes did you smoke per day?
   ___ cigarettes per day
   Do you smoke cigarettes now? 1 __ No 2 __ Yes
   IF NO: How old were you when you stopped smoking? ___ years old
   IF YES: On the average, about how many cigarettes a day do you smoke now? ___ cigarettes

9. Have you ever smoked a pipe or cigars regularly? 1 __ No 2 __ Yes If Yes,

   IF YES: For how many years? ___ years
   About how much? ___ pipes or cigars per ___ (day or week) 1 2

10. During the past year, have you taken any vitamins or minerals?
    1 __ No 2 __ Yes, fairly regularly 3 __ Yes, but not regularly If Yes,

    What do you take fairly regularly? # of PILLS per DAY, WEEK, etc.

    Multiple Vitamins
    One-a-day type ___ pills per ___
    Stress-tabs type ___ pills per ___
    Therapeutic, Theragran type ___ pills per ___ How many milligrams or IUs per pill?

    Other Vitamins
    Vitamin A ___ pills per ___ → ___ IU per pill
    Vitamin C ___ pills per ___ → ___ mg per pill
    Vitamin E ___ pills per ___ → ___ IU per pill
    Calcium or dolomite ___ pills per ___ → ___ mg per pill

    Other (What?) 1 __ Yeast 2 __ Selenium 3 __ Zinc 4 __ Iron 5 __ Beta-carotene
    6 __ Cod liver oil 7 __ Other ___

    Please list the brand of multiple vitamin/mineral you usually take: ___

-3-

FOR OFFICE USE
Q10. mg or IU. 1 = 50-100 2 = 200-250 3 = 400-500 4 = 1000 5 = 5000 6 = 10,000 7 = 20,000-25,000 8 = 50,000 9 = Unk.

11 Are you on a special diet?
1 ___ No 2 ___ Weight loss 3 ___ For medical condition 4 ___ Vegetarian 5 ___ Low salt
6 ___ Low cholesterol 7 ___ Weight gain

OFFICE USE

70 __ __

12 How often do you eat the following foods from *restaurants or fast food places*?

RESTAURANT FOOD	1 Almost every day	2 2-4 times a week	3 Once a week	4 1-3 times a month	5 5-10 times a year	6 1-4 times a year	7 Never or less than once a year
Fried chicken							
Burgers							
Pizza							
Chinese food							
Mexican food							
Fried fish							
Other foods							

72 __
73 __
74 __
75 __
76 __
77 __
78 __

13. This section is about your *usual* eating habits. Thinking back over the past year, how often do you usually eat the foods listed on the next page?

First, check (✓) whether your usual serving size is small, medium or large. (A small portion is about one-half the medium serving size shown, or less; a large portion is about one-and-a-half times as much, or more.)

Then, put a *NUMBER* in the most appropriate column to indicate *HOW OFTEN*, on the average, you eat the food. You may eat bananas *twice* a week (put a 2 *in the* "week" column). If you never eat the food, check "Rarely/Never." Please DO NOT SKIP foods. And please BE CAREFUL which column you put your answer in. It will make a big difference if you say "Hamburger once a day" when you mean "Hamburger once a week"!

Some items say "in season." Indicate how often you eat these just in the 2-3 month time when that food is in season. (Be careful about overestimating here.)

Please look at the *example* below. This person

1) eats a medium serving of cantaloupe once a week, in season.

2) has ½ grapefruit about twice a month.

3) has a small serving of sweet potatoes about 3 times a year.

4) has a large hamburger or cheeseburger or meat loaf about four times a week.

5) never eats winter squash.

EXAMPLE:

	Medium Serving	Your Serving Size S	M	L	How often? Day	Week	Month	Year	Rarely/Never
Cantaloupe (In season)	¼ medium		✓			1			
Grapefruit	1/2		✓				2		
Sweet potatoes, yams	½ cup	✓						3	
Hamburger, cheeseburger, meat loaf	1 medium					4			
Winter squash, baked squash	½ cup								✓

PLEASE GO TO NEXT PAGE →

FOR OFFICE USE

On the following two pages, code the four characters for each food as follows:

___	___ ___	___
S-1	No	Da-1
M-2	Times	Wk-2
L-3		Mo-3
NS-4	NS-99	Yr-4
		Nev-5
		NS-9

If respondent places a checkmark in the "How often" columns, do not impute "01", once. Instead, code "99", Not Stated. If respondent does not check a portion size, do not impute medium, but code "9".

	Medium Serving	Your Serving Size			How often?					OFFICE USE
		S	M	L	Day	Week	Month	Year	Never	
FRUITS & JUICES		S	M	L						
EXAMPLE - Apples, applesauce, pears	(1) or ½ cup		✓			4				
Apples, applesauce, pears	(1) or ½ cup									11 ____
Bananas	1 medium									15 ____
Peaches, apricots (canned, frozen or dried, whole, veal)	(1) or ½ cup									19 ____
Peaches, apricots, nectarines (fresh, in season)	1 medium									23 ____
Cantaloupe (in season)	½ medium									27 ____
Watermelon (in season)	1 slice									31 ____
Strawberries (fresh, in season)	½ cup									35 ____
Oranges	1 medium									39 ____
Orange juice or grapefruit juice	6 oz. glass									43 ____
Grapefruit	(½)									47 ____
Tang, Start breakfast drinks	6 oz. glass									51 ____
Other fruit juices, fortified fruit drinks	6 oz. glass									55 ____
Any other fruit, including berries, fruit cocktail	½ cup									59 ____
VEGETABLES		S	M	L	Da	Wk	Mo	Yr	Nv	
String beans, green beans	½ cup									63 ____
Peas	½ cup									67 ____
Chili with beans	½ cup									71 ____
Other beans such as baked beans, pinto, kidney beans, lima	½ cup									75 ____
Corn	½ cup									11 ____
Winter squash, baked squash	½ cup									15 ____
Tomatoes, tomato juice	(1) or 6 oz.									19 ____
Red chili sauce, taco sauce, salsa picante	2 Tblsp. sauce									23 ____
Broccoli	½ cup									27 ____
Cauliflower or brussel sprouts	½ cup									31 ____
Spinach (raw)	½ cup									35 ____
Spinach (cooked)	½ cup									39 ____
Mustard greens, turnip greens, collards	½ cup									43 ____
Cole slaw, cabbage, sauerkraut	½ cup									47 ____
Carrots, or mixed vegetables containing carrots	½ cup									51 ____
Green salad	1 med. bowl									55 ____
Salad dressing, mayonnaise (including on sandwiches)	2 Tblsp.									59 ____
French fries and fried potatoes	½ cup									63 ____
Sweet potatoes, yams	½ cup									67 ____
Other potatoes, including boiled, baked, potato salad	(1) or ½ cup									71 ____
Rice	½ cup									75 ____
Any other vegetable, including cooked greens, summer squash	½ cup									11 ____
Butter, margarine or other fat on vegetables, potatoes, etc.	2 pats									15 ____
MEAT, FISH, POULTRY & MIXED DISHES		S	M	L	Da	Wk	Mo	Yr	Nv	
Hamburgers, cheeseburgers, meat loaf	1 sandwich									19 ____
Beef—steaks, roasts	4 oz.									23 ____
Beef stew or pot pie with carrots, other vegetables	1 cup									27 ____
Liver, including chicken livers	4 oz.									31 ____
Pork, including chops, roasts	2 chops or 4 oz.									35 ____
Fried chicken	2 sm. or 1 lg. piece									39 ____
Chicken or turkey, roasted, stewed or broiled	2 sm. or 1 lg. piece									43 ____
Fried fish or fish sandwich	4 oz. or 1 sand.									47 ____
Tuna fish, tuna salad, tuna casserole	½ cup									51 ____
Shell fish (shrimp, lobster, crab, oysters, etc.)	(3) ½ cup or 3 oz.									55 ____
Other fish, broiled, baked	4 oz.									59 ____
Spaghetti, lasagna, other pasta with tomato sauce	1 cup									63 ____
Pizza	2 slices									67 ____
Mixed dishes with cheese (such as macaroni and cheese)	1 cup									71 ____

	Medium Serving	Your Serving Size			How often?					OFFICE USE
					Day	Week	Month	Year	Rarely/Never	
LUNCH ITEMS		S	M	L						
Luncheon meat	2 slices									7 ____
Hot dogs	2 dogs									11 ____
Sliced lunch meats	2 slices									15 ____
Vegetable soup, vegetable beef, minestrone, tomato soup	1 med. bowl									19 ____
Other soups	1 med. bowl									23 ____
BREADS, SALTY SNACKS, SPREADS		S	M	L	Da	Wk	Mo	Yr	Nv	
Biscuits, muffins, butter rolls (incl. fast foods)	1 med. piece									27 ____
White bread (including sandwiches), bagels, etc., crackers	2 slices, 3 crackers									31 ____
Dark bread (including whole wheat, rye, pumpernickel)	2 slices									35 ____
Corn bread, corn muffins, corn tortillas	1 med. piece									39 ____
Salty snacks, such as chips, popcorn	2 handfuls									43 ____
Peanuts, peanut butter	2 Tblsp									47 ____
Butter on bread or rolls	2 pats									51 ____
Margarine on bread or rolls	2 pats									55 ____
Gravies made with meat drippings, or white sauce	2 Tblsp									59 ____
BREAKFAST FOODS		S	M	L	Da	Wk	Mo	Yr	Nv	
High fiber bran or granola cereals, shredded wheat	1 med. bowl									63 ____
Highly fortified cereals, such as Product 19, Total, or Most	1 med. bowl									67 ____
Other cold cereals, such as Corn Flakes, Rice Krispies	1 med. bowl									71 ____
Cooked cereals	1 med. bowl									75 ____
Sugar added to cereal	2 teaspn									11 ____
Eggs (1 egg = small)	2 eggs = medium									15 ____
Bacon	2 slices									19 ____
Sausage	2 patties or links									23 ____
SWEETS		S	M	L	Da	Wk	Mo	Yr	Nv	
Icecream	1 scoop									27 ____
Doughnuts, cookies, cakes, pastry	1 pc. or 3 cookies									31 ____
Pumpkin pie, sweet potato pie	1 med. slice									35 ____
Other pies	1 med. slice									39 ____
Chocolate candy	small bar, 1 oz.									43 ____
Other candy, jelly, honey, brown sugar	3 pc. or 1 Tblsp									47 ____
DAIRY PRODUCTS		S	M	L	Da	Wk	Mo	Yr	Nv	
Cottage cheese	½ cup									51 ____
Other cheeses and cheese spreads	2 slices or 2 oz.									55 ____
Flavored yogurt	1 cup									59 ____
Whole milk and bevs. with whole milk (not incl. on cereal)	8 oz. glass									63 ____
2% milk and bevs. with 2% milk (not incl. on cereal)	8 oz. glass									67 ____
Skim milk, 1% milk or buttermilk (not incl. on cereal)	8 oz. glass									71 ____
BEVERAGES		S	M	L	Da	Wk	Mo	Yr	Nv	
Regular soft drinks	12 oz. can or bottle									75 ____
Diet soft drinks	12 oz. can or bottle									11 ____
Beer	12 oz. can or bottle									15 ____
Wine	1 med. glass									19 ____
Liquor	1 shot									23 ____
Decaffeinated coffee	1 med. cup									27 ____
Coffee, not decaffeinated	1 med. cup									31 ____
Tea (hot or iced)	1 med. cup									35 ____
Lemon in tea	1 teaspn									39 ____
Non-dairy creamer in coffee or tea	1 Tblsp									43 ____
Milk in coffee or tea	1 Tblsp									47 ____
Cream (real) or Half-and-Half in coffee or tea	1 Tblsp									51 ____
Sugar in coffee or tea	2 teaspn.									55 ____
Artificial sweetener in coffee or tea	1 packet									59 ____
Glasses of water, not counting in coffee or tea	8 oz. glass									63 ____

14. Think about your diet over the last year and the responses you have just made on this questionnaire. Are there any foods not mentioned which you ate at least once a week, even in small quantities, or ate frequently in a particular season? Consider other meats, breakfast foods, catsup, green chilies or jalapenos, avocado (guacamole), Mexican dishes, Chinese or other ethnic foods, other fruits or vegetables, as well as nutritional supplements (bran, etc.)? *Please take a look at the list of foods at the bottom of the page*

FOOD	Your Serving Size S	M	L	How Often? Day	Week	OFFICE USE Code	Amounts
						11	
						17	
						23	
						29	
						35	
						41	

	1 Seldom/Never	2 Sometimes	3 Often/Always		
15. How often do you eat the skin on chicken?	___	___	___	47	—
How often do you eat the fat on meat?	___	___	___	48	—
How often do you add salt to your food?	___	___	___	49	—
How often do you add pepper to your food?	___	___	___	50	—

16. How often do you use fat or oil in cooking?
For example, in frying eggs, meat or vegetables? ___ times per ___ (day, week, month) — 51 — — —

17. What do you usually cook with? 1 ___ Don't know or don't cook 2 ___ Soft margarine
3 ___ Stick margarine 4 ___ Butter 5 ___ Oil 6 ___ Lard, fatback, bacon fat
7 ___ Pam or no oil — 54 — —

18. What kind of fat do you usually add to vegetables, potatoes, etc?
1 ___ Don't add fat 2 ___ Soft margarine 3 ___ Stick margarine 4 ___ Butter
5 ___ Half butter, half margarine 6 ___ Lard, fatback, bacon fat — 56 — —

19. If you eat cold cereal, what kind do you eat most often? ___ — 58 — — —

20. Not counting salad or potatoes, about how many vegetables do you eat per day or per week? ___ vegetables per ___ day week — 61 — — —

21. Not counting juices, how many fruits do you usually eat per day or per week? ___ fruit per ___ day, week — 64 — — —

22. Have you gained or lost more than five pounds in the past year? (You may check more than one answer.)
1 ___ No 2 ___ Lost 5-15 lbs. 3 ___ Lost 16-25 lbs. 4 ___ Lost more than 25 lbs.
5 ___ Gained 5-15 lbs. 6 ___ Gained 16-25 lbs. 7 ___ Gained more than 25 lbs. — 67 —

68 — 0 0

DO YOU EAT THESE ONCE A WEEK?

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Source: Block, G. (1989). Health habits and history questionnaire: Diet history and other health risk factors. Bethesda, MD: National Cancer Institute.

SECTION IV: OTHER RELEVANT INFORMATION

A. NUTRITION-RELATED HEALTH PROBLEMS AND PREGNANCY

1. Do you now have or have you ever had any of these health problems? **(read list)**

		YES	NO	DON'T KNOW
a.	high blood pressure	____	____	____
b.	sugar diabetes	____	____	____
c.	heart trouble	____	____	____
d.	overweight	____	____	____
e.	cancer	____	____	____
f.	teeth problems	____	____	____
g.	stroke	____	____	____
h.	bone disease	____	____	____
i.	liver disease	____	____	____

2. Are you taking medicine for any of these? ____ ____ ____

For which one(s)?_____

3. Are you pregnant? **Yes**___ **No**____

If yes, how many months? _____

Are you breastfeeding? **Yes**___ **No**____

If no, why don't you breastfeed your baby?

_____

B. PERCEPTIONS OF HEALTH STATUS AND NUTRITION PROBLEMS

1. About how tall are you without shoes? _____

2. About how much do you weigh? _____

3. Do you consider yourself: **(Check if over or under weight by observation _____)**

   Underweight___ Overweight___ Average weight___

4. How would you rate your health right now? Would you say it is:

   Excellent___ Good___ Fair___ Poor___ Very Poor___

5. How would you rate your diet right now? Would you say it is:

   Excellent___ Good___ Fair___ Poor___ Very Poor___

6. How would you rate your level of nutrition knowledge? Would you say you know:

   __A whole lot__A lot__Not too much__Almost nothing

7. What do you think it means to have a good diet?

   _____

8. What do you think it means to have a bad diet?

   _____

9. What do you think it means to have a nutrition problem?

   _____

10. Do you or anyone in your family have a nutrition problem?

    Yes___ No___ Don't Know___

    If yes, what is the problem?_____

11. How would you rate the diets of people in this community right now? Would you say they are:

    Excellent__Good__Fair__Poor__Very Poor__Don't Know__

12. Do you think people in this community have nutrition problems?

    Yes___ No___ Don't Know___

    If yes, what are they?_____

C. SOURCES OF NUTRITION INFORMATION

1. Where do you get information about nutrition from? Do you get information from **(read list)**:

		YES	NO
a.	Your doctor	____	____
b.	Other health professionals - nurses, dieticians	____	____
c.	Hospital or clinic	____	____
d.	Newspaper	____	____
e.	Magazines	____	____
f.	Books	____	____
g.	Health pamphlets	____	____
h.	Television shows	____	____
i.	Television commercials	____	____
j.	Radio shows	____	____
k.	Radio commercials	____	____
l.	Family members	____	____
m.	Friends	____	____
n.	School (where you or your child go)	____	____
o.	Work	____	____
p.	Community organizations	____	____
q.	Church	____	____
r.	Other sources **(please name)**_____		

2. From which of these sources do you get the most nutrition information?

_____

D. FOOD PURCHASING ISSUES

1. Who or what influences your decisions the most about the kind of food you buy and eat?

   _____

2. Where do you do most of your grocery shopping?

   _____

3. Do you ever read the labels on foods when you shop?

   Always___ Sometimes___ Never___

   If yes:

   Do you understand the labels? **Yes___ No___ Sometimes___**

   Do they help you to pick out foods? **Yes___ No___ Sometimes___**

4. How much do you spend a month on food?

   _____

5. When you shop, do you use:

   Cash___ Food stamps___ Both___

E. FOOD ASSISTANCE PROGRAMS

1. Are you a member of:

   WIC___ EFNEP___Food Stamp Program___Cooperative Extension___

   OtherFoodProgram_____

2. Are your children in the school lunch or breakfast program?

   Yes___ No___ Not Applicable ___

3. Do you ever have to get emergency food? **Yes____ No____**

   If yes:

   a. How often? _____

   b. From whom? _____

   c. For what reason(s)? _____

F. NUTRITION EDUCATION PROGRAM NEEDS

1. If a nutrition education program was planned for this community:

   a. Would you attend? **Yes**___ **No**___ **Don't Know**___

      If no, why not?

      _____

   b. Where should it be held?

      _____

   c. What time of day and day of the week should it be held?

      _____

   d. How should we tell people about it?

      _____

   e. What do we need to do to get people to come?

      _____

   f. What should we talk about?

      _____

2. What type of information or help do you need to learn more about nutrition or to improve your diet and the diet of your family?

   _____

   _____

   _____

G. DEMOGRAPHIC INFORMATION

Age: ___ 18-24___ 25-34 ___ 35-44 ___ 45-54___ 55-64 ___ 65-74 ___ 75+

Race: ___ African American ___ White

Occupation: _____

Education:

What is the highest grade in school you have completed?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Martial Status:

___Single___Married___Separated___Divorced___Widowed

No. of Children: _____

Housing Development:

College Homes ___
College Hills ___
Lonsdale Homes ___
Western Heights/ ___
Western Addition

THANK YOU VERY MUCH FOR TAKING THE TIME TO ANSWER THIS SURVEY. YOUR ANSWERS WILL HELP US TO PLAN THE RIGHT KIND OF NUTRITION PROGRAM FOR THIS COMMUNITY.

APPENDIX C

JUDGES RATINGS OF KNOWLEDGE TEST ITEMS

JUDGES RATINGS OF KNOWLEDGE TEST ITEMS

Guideline/Objective	Ratings[a]						
Guideline	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
Eat a Variety of Foods.							
1. The best way to get a well-balanced diet is to:	62	25	38	0	13	0	25
2. Which of these is not one of the four food groups?	38	6	31	0	13	19	25
3. How many servings of fruits & vegetables should an adult eat every day?	50	25	25	0	19	6	25
4. How many servings of breads & cereals should an adult eat every day?	50	25	25	6	13	13	25
5. How many servings of milk or milk products should an adult eat every day?	50	31	19	6	25	0	19
6. How many servings of meat should an adult eat each day?	44	25	19	6	25	6	19
7. Which of these foods belong to the fruit and vegetable group?	63	19	44	0	25	0	13
8. Which of these foods belong to the bread and cereal group?	63	31	31	0	25	0	13
9. Which of these foods belong to the meat group?	63	31	31	0	19	6	13
10. Which of these foods belong to the milk group?	62	31	31	0	25	0	13
11. Which of these groups of foods could be used in place of meat?	68	38	31	6	6	6	13
12. Which of these foods has the most vitamin A?	75	38	38	6	6	6	6
13. Which of these foods has the most vitamin C?	88	44	44	0	0	0	13
14. Which of these foods has a lot of calcium?	88	38	50	6	0	0	6

JUDGES RATINGS CONT.

Guideline/Objective	Ratings[a]						
Guideline	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
Maintain Desirable Weight.							
15. Which of these list of foods should a person eat less of if they want to stay the same weight or lose weight?	50	6	44	13	25	0	13
16. Which of these lists of foods would not be good for a person to eat if they want to lose weight?	56	19	38	13	19	6	6
Avoid too much fat, saturated fat and cholesterol.							
17. Saturated fat is a type of fat found mostly in:	69	31	38	19	6	0	6
18. Which foods have a lot of saturated fat in them?	56	38	19	19	19	0	6
19. Cholesterol is a type of fat found in:	56	25	31	19	13	0	13
20. Which foods have a lot of cholesterol in them?	75	31	44	13	0	0	13
21. The best way to tell how much fat and cholesterol are in a food product is to:	69	31	38	6	13	0	6
22. Which one of these ways of cooking chicken would have the highest amount of fat?	94	50	44	0	0	0	6
Adequate Starch and Fiber.							
23. Most of the food in your diet should come from eating foods which are high in:	38	25	13	19	31	0	13
24. Which list of foods does not have carbohydrate foods in it?	56	25	31	31	0	0	13

JUDGES RATINGS CONT.

Guideline/Objective	Ratings[a]						
Guideline	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
Adequate Starch and Fiber Cont.							
25. Starches like potatoes, rice, macaroni and spaghetti are examples of:	38	19	13	19	31	6	13
26. The part of plant foods which cannot be broken down by the body is called:	75	25	50	6	13	0	6
Avoid Too Much Sugar.							
27. The best way to tell how much sugar is in a food product is to:	44	25	19	31	13	6	6
28. Sugar comes in many forms. Which of these is another form of sugar?	75	31	44	6	0	0	18
Avoid Too Much Sodium.							
29. Another name for salt is:	75	37	38	6	0	6	13
30. Which of these is not be a good seasoning to use instead of salt?	88	25	63	0	6	0	6
31. The best way to tell how much salt is in a food product is to:	56	25	31	19	6	6	12
If You Drink Alcohol, Do So in Moderation.							
32. Drinking a moderate amount of beer or wine means a person will drink:	56	25	31	19	6	6	13
33. Drinks like beer and wine are:	68	31	38	12	6	0	13

JUDGES RATINGS CONT.

Guideline/Objective	Ratings[a]						
Objective	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
Major Foods Low in Fat and Sodium, High in Calories and Sugar, and Good Sources of Fiber.							
34. The foods that have the most fat in them are:	88	31	56	6	0	0	6
35. Which of these foods is low in fat?	56	19	38	25	6	0	13
36. Which of these foods has a lot of salt in them?	50	13	31	25	19	0	6
37. Which of these foods do not have a lot of salt in them?	87	25	63	0	6	0	6
38. Which list of foods has the most calories?	69	19	50	13	13	0	6
39. Which of these foods gives a lot of calories but not very many vitamins and minerals?	88	25	63	6	0	0	6
40. Which of these foods is not a high calorie food?	69	19	50	6	13	6	6
41. Which of these foods would have a lot of sugar in it?	63	25	38	19	6	0	13
42. Which of these foods would have a lot of sugar in it?	50	19	31	25	0	0	25
43. The foods that have the most sugar in them are:	56	19	38	13	13	13	19
44. Which of these foods does not have a lot of fiber?	69	19	50	0	13	0	19

JUDGES RATINGS CONT.

Guideline/Objective	Ratings[a]						
Objective	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
Weight Loss Principles.							
45. The best way to lose weight in the long run is to:	81	25	56	6	6	0	6
46. Which of these ways of losing weight is the best way?	75	13	62	13	6	0	6
47. Which of these ways of losing weight is the best way?	63	6	56	6	19	0	13
Suspected Diet-Disease Links for Nutrition-Related Disorders.							
General							
48. Which one of these is not a disease related to nutrition?	56	25	31	19	0	0	25
49. Which one of these is not a health problem related to nutrition?	56	19	31	31	6	0	6
Heart Disease							
50. A person's chance of having a heart attack is higher if they have a:	94	50	44	0	0	0	6
51. Which of these diet habits might lower a person's chance of having a heart attack?	75	31	44	6	0	0	6
52. The build up of plaque in the heart's vessels comes from eating foods that are high in:	81	38	44	6	6	0	19

JUDGES RATINGS CONT.

Guideline/Objective	Ratings[a]						
Objective	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
High Blood Pressure and Stroke							
53. People who have high blood pressure can make it worse by eating foods too high in:	81	25	56	6	6	0	6
54. Which of these health problems might be related to eating too much salt?	69	25	44	0	13	6	13
Osteoporosis							
55. Which of these diseases come from not eating enough foods like milk and cheese?	62	19	44	13	13	0	13
Cancer							
56. Which of these diet habits would help to prevent you from getting cancer?	81	19	63	6	0	0	13
57. Which of these diet habits would help to prevent you from getting cancer?	50	19	38	25	6	0	19
58. Which of these vegetables might help prevent you from getting cancer?	50	12	13	25	6	0	19
59. If a person wants to prevent getting cancer, which of these foods should they not eat:	31	19	13	25	13	19	13
60. Fiber is important in your diet because it helps to keep you from:	88	25	63	0	0	0	13
Dental							
61. The main health problem caused by eating too many sugar foods is:	75	25	50	13	0	0	13

JUDGES RATINGS CONT.

Guideline/Objective	Ratings[a]						
Objective	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
Cirrhosis							
62. Which of these health problems could come from drinking a lot of beer and wine?	69	31	38	0	19	6	13
Diabetes							
63. A major cause of diabetes is:	56	19	38	13	6	6	19
Obesity							
64. Which of these health problems could you get from being overweight?	68	32	38	13	0	0	19
65. Which of these foods or drinks would not make you gain weight if you eat or drink a lot of them?	62	19	44	13	13	0	13

Note. n = 16. For some items, a few judges gave written comments instead of rating them. Ratings are rounded.

[a]SF = strongly favorable; F = favorable; UD = undecided; UF = unfavorable; SUF = strongly unfavorable; NR = no rating.

APPENDIX D

JUDGES RATINGS OF BELIEFS SCALE ITEMS

JUDGES RATINGS OF BELIEFS SCALE ITEMS

HBM Construct/ Item #	Ratings[a] (n = 6)						
Susceptibility	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
1	83	33	50	0	17	0	0
2	50	17	33	33	0	17	0
3	100	67	33	0	0	0	0
4	100	33	67	0	0	0	0
5	50	17	33	17	17	17	0
6	33	17	17	17	0	17	33
7	33	0	33	33	0	0	33
8	33	17	17	0	17	17	33
9	17	0	17	0	33	33	17
10	50	0	50	0	17	33	0
11	67	33	33	0	0	17	17
12	67	33	33	0	0	17	17
13	50	0	50	17	0	33	0
14	33	17	17	17	17	17	17

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Susceptibility Cont.	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
15	50	0	50	0	17	17	17
16	67	17	50	0	0	17	17
17	50	0	50	0	17	33	0
18	50	0	50	17	17	17	0
19	67	17	50	0	17	17	0
20	83	17	67	0	0	0	0
21	67	17	50	0	17	17	0
22	83	50	33	0	0	17	0
23	67	33	33	17	0	17	0
24	33	0	33	33	17	17	0
25	83	50	33	0	0	17	0
26	67	33	33	0	17	17	0
27	83	33	50	0	0	17	0
28	50	33	17	17	17	17	0
29	83	50	33	0	0	17	0

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Seriousness	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
1	50	50	0	0	17	17	17
2	67	67	0	17	0	17	0
3	67	33	33	33	0	0	0
4	67	50	17	17	0	17	0
5	67	0	67	0	17	0	17
6	0	0	0	17	50	33	0
7	83	33	50	17	0	0	0
8	33	17	17	0	17	17	33
9	33	0	33	0	33	33	0
10	83	33	50	0	0	17	0
11	67	17	50	17	0	17	0
12	67	33	33	17	0	17	0
13	83	33	50	0	0	17	0
14	67	17	50	0	17	17	0

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Seriousness Cont.	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
15	50	17	33	33	0	17	0
16	83	33	50	0	0	17	0
17	83	33	50	0	0	17	0
18	67	50	17	17	0	17	0
19	67	33	33	17	0	17	0
20	83	50	33	17	0	17	0
21	67	17	50	0	17	17	0
22	67	33	33	17	0	17	0
23	83	33	50	0	0	17	0
24	33	50	17	17	0	17	17

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Benefits	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
1	83	33	50	0	17	0	0
2	50	33	17	17	17	17	0
3	67	33	33	17	0	0	17
4	100	67	33	0	0	0	0
5	83	50	33	17	0	0	0
6	100	67	33	0	0	0	0
7	100	67	33	0	0	0	0
8	50	33	17	17	0	17	17
9	67	33	33	0	0	17	17
10	100	67	33	0	0	0	0
11	100	33	67	0	0	0	0
12	100	17	83	0	0	0	0
13	100	17	83	0	0	0	0
14	83	17	67	17	0	0	0
15	83	33	50	0	0	0	17

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Benefits Cont.	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
16	50	33	17	17	0	17	17
17	100	33	67	0	0	0	0
18	83	17	67	17	0	0	0
19	50	33	17	0	0	33	17
20	83	33	50	0	0	17	0
21	83	33	50	17	0	0	0
22	83	17	67	17	0	0	0
23	83	50	33	0	0	17	0
24	67	33	33	0	17	0	17
25	83	33	50	0	17	0	0
26	83	50	33	0	17	0	0
27	100	67	33	0	0	0	0

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Barriers	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
1	100	17	67	0	0	0	0
2	83	17	50	0	17	17	0
3	83	50	33	0	0	17	0
4	100	33	33	17	0	17	0
5	100	0	33	33	17	17	0
6	83	33	33	0	17	17	0
7	83	33	50	0	0	17	0
8	83	33	17	17	17	17	0
9	100	67	33	0	0	0	0
10	100	50	50	0	0	0	0
11	83	50	33	0	17	0	0
12	83	17	67	17	0	0	0
13	100	50	50	0	0	0	0
14	83	67	17	0	0	17	0
15	83	50	33	0	17	0	0

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Barriers Cont.	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
16	100	50	50	0	0	0	0
17	100	33	67	0	0	0	0
18	100	33	67	0	0	0	0
19	83	33	50	0	17	0	0
20	83	50	33	0	17	0	0
21	100	67	33	0	0	0	0
22	83	17	67	17	0	0	0
23	100	33	67	0	0	0	0
24	50	17	33	33	17	0	0
25	67	0	67	17	0	17	0
26	100	33	67	0	0	0	0
27	83	33	50	17	0	0	0
28	67	33	33	17	0	17	0
29	50	17	33	33	0	17	0
30	67	33	33	17	0	17	0

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Cues to Action	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
1	67	50	17	0	0	17	17
2	33	17	17	33	17	17	0
3	67	50	17	0	0	17	17
4	83	50	33	0	0	17	0
5	50	33	17	0	17	17	17
6	83	50	33	0	0	17	0
7	67	33	17	0	17	17	17
8	50	33	17	0	17	17	17
9	67	17	50	0	0	17	17
10	83	50	33	0	0	17	0
11	83	33	50	0	0	17	0
12	67	17	50	17	0	17	0
13	83	33	50	17	0	0	0
14	83	50	33	17	0	0	0
15	100	50	50	0	0	0	0

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
Cues to Action Cont.	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
16	83	50	33	0	0	0	17
17	100	33	67	0	0	0	0
18	83	50	33	0	0	17	0
19	83	50	33	0	0	17	0
20	50	50	0	0	17	33	0
General Motivation							
1	100	67	33	0	0	0	0
2	83	50	33	0	0	17	0
3	67	33	33	33	0	0	0
4	83	50	33	17	0	0	0
5	83	67	17	17	0	0	0
6	100	50	50	0	0	0	0
7	83	33	50	17	0	0	0
8	67	50	17	17	0	17	0
9	67	33	33	17	17	0	0

JUDGES RATINGS CONT.

HBM Construct/ Item #	Ratings[a] (n = 6)						
General Motivation Cont.	% SF/F	% SF	% F	% UD	% UF	% SUF	% NR
10	83	0	83	0	17	0	0
11	83	67	17	0	0	0	17
12	83	33	50	0	0	0	17
13	100	33	67	0	0	0	0
14	83	67	17	0	0	17	0
15	83	67	17	0	0	17	0
16	83	50	33	0	17	0	0
17	100	67	33	0	0	0	0
18	100	50	50	0	0	0	0
19	83	33	50	17	0	0	0
20	50	33	17	17	17	17	0

Note. Two judges did not rate any of the items, but offered written comments.

[a]SF = strongly favorable, F = favorable, UD = undecided, UF = unfavorable, SUF = strongly unfavorable, NR = no rating.

APPENDIX E

THE FINAL SURVEY INSTRUMENT WITH SOURCES OF ITEMS USED

MLB NUTRITION EDUCATION SURVEY

SUBJECT NUMBER_____

General Information:

Name: _____

Address: _____
(Include unit number and zip code)

Phone Number: _____

Age: _____ **years**

Race: _____1.African American _____2.White _____3.Other

Occupation: _____

Education: Circle the highest grade in school you have completed.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Martial Status: (Check one)

_____1. Single _____4. Divorced
_____2. Married _____5. Widowed
_____3. Separated

Number of Children:_____

Housing Development: (Check one)

_____1. College Homes _____3. Lonsdale Homes
_____2. College Hills _____4. Western Heights

How long have you lived here?_____**years or months**

Where did you live 5 years ago? (Check one)

_____1. In this development
_____2. In another development in Knoxville
_____3. In another part of Knoxville
_____4. In another part of Tennessee
_____5. In another state
_____6. In another country

CHECK HERE IF YOU RECEIVED A LETTER IN THE MAIL ABOUT THIS SURVEY. _____

SECTION I: Nutrition Knowledge Test

A. The Food Groups

Listen carefully to the directions before you begin this section. Then, circle the answer you think is the best one. Circle 8 if you don't know the answer.

Response Key: 1 = fruit; 2 = vegetable; 3 = meat; 4 = milk; 5 = bread; 6 = other; 8 = don't know.

Food Item							
1. lettuce	1	2	3	4	5	6	8
2. rolls	1	2	3	4	5	6	8
3. butter	1	2	3	4	5	6	8
4. roast beef	1	2	3	4	5	6	8
5. macaroni	1	2	3	4	5	6	8
6. cabbage	1	2	3	4	5	6	8
7. cheese	1	2	3	4	5	6	8
8. bananas	1	2	3	4	5	6	8
9. oatmeal	1	2	3	4	5	6	8
10. mayonnaise	1	2	3	4	5	6	8
11. pears	1	2	3	4	5	6	8
12. yogurt	1	2	3	4	5	6	8
13. pork chops	1	2	3	4	5	6	8
14. lard	1	2	3	4	5	6	8
15. cucumbers	1	2	3	4	5	6	8
16. lemons	1	2	3	4	5	6	8
17. cookies	1	2	3	4	5	6	8
18. bologna	1	2	3	4	5	6	8
19. pudding	1	2	3	4	5	6	8
20. potato chips	1	2	3	4	5	6	8

WAIT! Don't Start The Next Section Until The Interviewer Tells You To!

B. Foods High in Fat, Sugar, Salt, Cholesterol, and Calories

Listen carefully to the directions before you begin this section. Then, circle the answer you think is the best one. Circle 8 if you don't know the answer.

					Don't Know
Which of these two foods has the <u>most</u> fat?					
21.	1.	chicken fried in lard	2.	baked chicken	8.
22	1.	butter	2.	cottage cheese	8.
23.	1.	skim milk	2.	whole milk	8.
24.	1.	hamburgers	2.	potato	8.
25.	1.	collard greens with ham hock	2.	collard greens with smoked turkey	8.
Which of these two foods has the <u>most</u> sugar added to it?					
26.	1.	Frosted Flakes	2.	Cheerios	8.
27.	1.	crackers	2.	cookies	8.
28.	1.	ketchup	2.	soy sauce	8.
29.	1.	oatmeal	2.	pork and beans	8.
30.	1.	candied sweet potatoes	2.	grits	8.
Which of these two foods has the <u>most</u> salt?					
31.	1.	green beans with salt pork	2.	green beans with margarine	8.
32.	1.	bacon	2.	baked veal	8.
33.	1.	frozen carrots	2.	canned carrots	8.
34.	1.	pot pie	2.	boiled noodles	8.
35.	1.	white rice	2.	Rice-a-Roni	8.
Which of these two foods has the <u>most</u> cholesterol?					
36.	1.	eggs	2.	2% milk	8.
37.	1.	turkey	2.	liver	8.
38	1.	lean beef	2.	chitterlings	8.
39.	1.	peanut butter	2.	mayonnaise	8.
40.	1.	potatoes fried in butter	2.	potatoes fried in oil	8.
Which of these two foods has the <u>most</u> calories?					
41.	1.	hard candy	2.	chocolate candy	8.
42.	1.	fried okra	2.	boiled okra	8.
43.	1.	chicken with skin	2.	lean beef	8.
44.	1.	baked fish	2.	breaded fish sticks	8.
45.	1.	potato salad	2.	baked potato	8.

WAIT! Don't Start The Next Section Until The Interviewer Tells You To!

C. Multiple Choice Items

Listen carefully to the directions before you begin this section. Then, circle the answer you think is the best one. Circle 8 if you don't know the answer.

46. The best way to get all the nutrients your body needs is to:

1. eat a lot of food
2. eat a lot of meat
3. eat many different kinds of food
4. take a vitamin pill every day
8. don't know

47. Which of these foods could you use in place of meat?

1. black-eyed peas with rice
2. pancakes
3. potatoes
4. margarine
8. don't know

48. Which of these foods could you eat as a substitute for drinking milk?

1. eggs
2. rice
3. butter
4. cottage cheese
8. don't know

49. Which of these foods has a lot of Vitamin A?

1. cauliflower
2. celery
3. sweet potatoes
4. mushrooms
8. don't know

50. Which of these foods has a lot of Vitamin C?

1. apples
2. bananas
3. peaches
4. oranges
8. don't know

51. Which of these foods has a lot of calcium?

1. eggs
2. corn
3. cheese
4. peas
8. don't know

52. Which of these foods <u>should not</u> be eaten often if you want to lose weight or stay the same weight?

1. macaroni
2. fried foods
3. potatoes
4. biscuits
8. don't know

53. The part of plant foods which cannot be broken down by the body is called:

1. protein
2. fiber
3. starch
4. fat
8. don't know

54. Which of these is not a starchy food?

1. spaghetti
2. corn bread
3. lima beans
4. lamb
8. don't know

55. Which of these is not a form of sugar?

1. molasses
2. spices
3. honey
4. Karo syrup
8. don't know

56. Another name for salt is:

1. potassium
2. sodium
3. selenium
4. calcium
8. don't know

57. Which of these seasonings would not be a healthy substitute for salt?

1. lemon juice
2. spices
3. garlic salt
4. herbs
8. don't know

58. Drinking a moderate amount of beer, wine, or whiskey means you should drink no more than:

1. 1 or 2 drinks a day
2. 3 or 4 drinks a day
3. 5 or 6 drinks a day
4. 7 or 8 drinks a day
8. don't know

59. Drinks like beer, wine, and whiskey are:

1. good for the stomach's sake
2. a good source of nutrients
3. good for your body
4. high in calories and low in nutrients
8. don't know

60. Which of these foods has a lot of fiber?

1. an apple with peel
2. chicken with skin
3. hot dogs
4. a biscuit with butter
8. don't know

61. The best way to lose weight in the long run to:

1. stop eating potatoes and bread
2. eat one meal a day
3. exercise more and eat less calories
4. Use Slim Fast or take diet pills
8. don't know

62. Which of these is not a disease related to foods people eat?

1. heart trouble
2. pneumonia
3. diabetes
4. high blood pressure
8. don't know

63. Which one of these is not a health problem related to foods people eat?

1. teeth problems
2. measles
3. cancer
4. overweight
8. don't know

64. Your chances of having a heart attack are higher if you have a:

1. high blood cholesterol level
2. low blood cholesterol level
3. high blood count
4. low blood sugar level
8. don't know

65. Which of these food habits may lower your chances of having heart trouble?

1. eating less fatty foods
2. eating less starchy foods
3. eating more meat
4. eating garlic
8. don't know

66. The build up of plaque in the heart's vessels can come from eating foods that are high in:

1. protein
2. fat and cholesterol
3. sugar
4. salt
8. don't know

67. People who have high blood pressure can make it worse by eating too much:

1. salt
2. sugar
3. fat
4. pepper
8. don't know

68. Which of these health problems may be related to eating too much salt?

1. diabetes
2. arthritis
3. stroke
4. cancer
8. don't know

69. Which of these diseases may come from not eating enough foods like milk and cheese?

1. diabetes
2. heart trouble
3. high blood pressure
4. bone disease
8. don't know

70. Which of these food habits may not help to prevent cancer?

1. eating foods high in fiber
2. eating foods low in sugar
3. eating foods low in fat
4. eating foods like cabbage and greens
8. don't know

71. Fiber is important to eat because it can help prevent:

1. arthritis
2. gout
3. bladder trouble
4. constipation
8. don't know

72. The main health problem caused by eating too many sugar foods is:

1. diabetes
2. cancer
3. cavities
4. heart trouble
8. don't know

73. Which of these diseases could come from drinking too much beer, wine, or whiskey?

1. bone disease
2. liver disease
3. kidney disease
4. lung disease
8. don't know

74. Which of these may contribute to diabetes in adults?

1. eating too much sugar
2. eating too much fat
3. eating too many starches
4. being overweight
8. don't know

75. People who are overweight have a higher chance of getting:

1. heart trouble
2. high blood pressure
3. diabetes
4. all these problems
8. don't know

SECTION II: Nutrition Beliefs Scale

Listen carefully to the directions before you begin this section. Then, circle the answer that best fits how you feel about the statement.

Response Key: 5 = really agree; 4 = agree; 3 = unsure; 2 = disagree; 1 = really disagree.

1. If I eat a lot of sweet foods, I could have problems with my teeth.	5	4	3	2	1
2. If I eat less salty food or use less salt, it would prevent me from having a stroke.	5	4	3	2	1
3. Bad nutrition could affect my daily activities.	5	4	3	2	1
4. Community health programs, including nutrition ones, are used by the government to spy on people.	5	4	3	2	1
5. I shouldn't smoke if I want to stay healthy for a long time.	5	4	3	2	1
6. If one of my relatives or friends gave me advice about nutrition, I would listen to them.	5	4	3	2	1
7. If I read food labels when I shop, I could pick foods that are the best for my health.	5	4	3	2	1
8. I believe all the talk about nutrition is just a trick to get people to spend their money.	5	4	3	2	1
9. If I don't eat enough foods like milk and cheese, I might hurt my bones and teeth.	5	4	3	2	1
10. Meats don't taste as good if they are baked or broiled instead of fried.	5	4	3	2	1
11. High blood pressure is not that serious because it can't kill you.	5	4	3	2	1
12. Eating less of foods that come in cans, boxes or packages would lower the amount of salt and sugar I take in.	5	4	3	2	1
13. If I eat too many foods high in fat and sugar, I could gain weight.	5	4	3	2	1
14. Having bad nutrition isn't that serious because I know a lot of people who eat anything they want and never get sick.	5	4	3	2	1
15. It takes too much time to fix foods in a nutritious manner.	5	4	3	2	1
16. I would listen to my minister talk about nutrition.	5	4	3	2	1
17. Controlling stress is important to staying healthy.	5	4	3	2	1

18. Cooking in different ways, like baking foods instead of frying them, would lower the amount of fat I take in.	5	4	3	2	1
19. Fried foods can be bad for my heart.	5	4	3	2	1
20. If I eat more fresh fruits and vegetables, I could control my weight or lose weight.	5	4	3	2	1
21. I can't get to a grocery store where I could buy better or cheaper foods because I don't have transportation.	5	4	3	2	1
22. If I eat less salty food or use less salt, I could prevent or control high blood pressure.	5	4	3	2	1
23. I look for new information related to my health.	5	4	3	2	1
24. Having good nutrition would give me more energy.	5	4	3	2	1
25. I get at least 7-8 hours of sleep each day.	5	4	3	2	1
26. TV or radio commercials help me to know what is good and bad nutrition.	5	4	3	2	1
27. The grocery store where I do most of my food shopping doesn't sell the kinds of food I need to have good nutrition.	5	4	3	2	1
28. I might get sick if I don't eat right.	5	4	3	2	1
29. Drinking less alcohol could help me prevent liver problems.	5	4	3	2	1
30. Foods cooked with oil instead of lard or butter don't taste good.	5	4	3	2	1
31. Keeping my weight down is important to health.	5	4	3	2	1
32. Drinking a lot of beer, wine, or whiskey could damage my liver.	5	4	3	2	1
33. I have a hard time understanding nutrition information.	5	4	3	2	1
34. Good nutrition is a major factor in preventing diseases.	5	4	3	2	1
35. I think about my health a lot.	5	4	3	2	1
36. I believe in God, so I won't get sick, even if I don't eat right.	5	4	3	2	1
37. Being overweight isn't a problem, as long as you carry your weight well.	5	4	3	2	1
38. I always follow the doctor's orders because I believe they will help my health.	5	4	3	2	1
39. I read a health pamphlet which helped me learn about nutrition.	5	4	3	2	1

40. I could get high blood pressure or have a stroke if I eat too much salt or pork.	5	4	3	2	1
41. There is nothing I can do to prevent getting bone disease.	5	4	3	2	1
42. Having good nutrition is more trouble than it's worth.	5	4	3	2	1
43. If I ever got cancer, it would probably hurt a lot.	5	4	3	2	1
44. Having good nutrition really doesn't matter because you're going to die from something anyway.	5	4	3	2	1
45. If I don't eat right, I won't get all the things my body needs to stay healthy.	5	4	3	2	1
46. If I changed my eating habits it probably wouldn't help me.	5	4	3	2	1
47. I shouldn't eat a whole lot of salty foods or use too much salt because it could make me sick.	5	4	3	2	1
48. Having good nutrition could help control diabetes.	5	4	3	2	1
49. I can't afford to have good nutrition. It's too expensive.	5	4	3	2	1
50. Liver problems are not that serious.	5	4	3	2	1
51. I don't trust what doctors and other health people say about nutrition.	5	4	3	2	1
52. Good health is an important part of life.	5	4	3	2	1
53. I learned about nutrition from reading different books.	5	4	3	2	1
54. I could get heart trouble if I eat too many foods like eggs, bacon or liver.	5	4	3	2	1
55. I know how to read the labels on foods.	5	4	3	2	1
56. If I eat less fatty food, it could prevent me from getting heart trouble.	5	4	3	2	1
57. I would change the way I now eat if one of my relatives or friends got a certain health problem or disease.	5	4	3	2	1

(If you circled 4 or 5, answer this question. What problem or disease could your relative or friend get that would make you change the way you now eat?)

_____

WAIT! Don't Start The Next Section Until The Interviewer Tells You To!

SECTION III: Dietary Intake - Food Frequency Scale

Listen carefully to the directions before you begin this section. Then circle the answer that best shows how often you eat each food.

Response Key: 1 = daily; 2 = 3-4x/week; 3 = 1-2x/week; 4 = 1-2x/month; 5 = 1-2x/year; 6 = never eat/don't like; 8 don't know the food.

Fruits

Food Item	How Often Do You Eat The Food						
Apples or applesauce	1	2	3	4	5	6	8
Pears	1	2	3	4	5	6	8
Bananas	1	2	3	4	5	6	8
Peaches, apricots, nectarines	1	2	3	4	5	6	8
Cantaloupe (in season)	1	2	3	4	5	6	8
Watermelon (in season)	1	2	3	4	5	6	8
Strawberries (in season)	1	2	3	4	5	6	8
Berries or fruit cocktail	1	2	3	4	5	6	8
Pineapple	1	2	3	4	5	6	8
Prunes	1	2	3	4	5	6	8
Grapes	1	2	3	4	5	6	8
Raisins	1	2	3	4	5	6	8
Oranges or grapefruit	1	2	3	4	5	6	8
Orange or grapefruit juice	1	2	3	4	5	6	8
Other fruit juices like apple, grape	1	2	3	4	5	6	8

1. Not counting juices, how many fruits do you usually eat per day? _____
(Number of fruits)

2. When you eat fruits, how often are they: **(Put a check on the line for each one)**

	1 Always	2 Sometimes	3 Never
1. Fresh or raw?	_____	_____	_____
2. Frozen?	_____	_____	_____
3. Canned?	_____	_____	_____
4. Cooked - boiled?	_____	_____	_____

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Vegetables

Food Item	How Often Do You Eat The Food						
Green beans or string beans	1	2	3	4	5	6	8
Green peas	1	2	3	4	5	6	8
Corn	1	2	3	4	5	6	8
Squash	1	2	3	4	5	6	8
Okra	1	2	3	4	5	6	8
Tomatoes or tomato juice	1	2	3	4	5	6	8
Beets	1	2	3	4	5	6	8
Broccoli	1	2	3	4	5	6	8
Cauliflower	1	2	3	4	5	6	8

Vegetables Continued

Food Item	How Often Do You Eat The Food						
Brussels sprouts	1	2	3	4	5	6	8
Cabbage	1	2	3	4	5	6	8
Coleslaw or sauerkraut	1	2	3	4	5	6	8
Greens - turnips, mustard, collards	1	2	3	4	5	6	8
Spinach	1	2	3	4	5	6	8
Lettuce salad	1	2	3	4	5	6	8
Carrots	1	2	3	4	5	6	8
Green pepper	1	2	3	4	5	6	8
Onions	1	2	3	4	5	6	8
Celery	1	2	3	4	5	6	8
Fried potatoes or french fries	1	2	3	4	5	6	8
Baked potato	1	2	3	4	5	6	8
Mashed potatoes	1	2	3	4	5	6	8
Sweet potatoes or yams	1	2	3	4	5	6	8
Potato salad	1	2	3	4	5	6	8

1. Not counting salad or potatoes, how many vegetables do you usually eat per day?

   _____
   (Number of vegetables)

2. When you eat vegetables, how often are they: **(Put a check on the line for each one)**

	1 Always	2 Sometimes	3 Never
1. Fresh or raw?	_____	_____	_____
2. Frozen?	_____	_____	_____
3. Canned?	_____	_____	_____
4. Boiled?	_____	_____	_____
5. Cooked with fat or butter?	_____	_____	_____
6. Cooked with oil or margarine?	_____	_____	_____
7. Cooked with salt?	_____	_____	_____

Meat, Poultry, Fish, and Meat Alternatives

Food Item	How Often Do You Eat The Food						
Beef - roast or steak	1	2	3	4	5	6	8
Hamburger or cheeseburger	1	2	3	4	5	6	8
Ground beef or meat loaf	1	2	3	4	5	6	8
Barbecue ribs	1	2	3	4	5	6	8
Pork chops or roast	1	2	3	4	5	6	8
Ham	1	2	3	4	5	6	8
Veal	1	2	3	4	5	6	8
Lamb	1	2	3	4	5	6	8
Fried chicken	1	2	3	4	5	6	8
Chicken or turkey baked, broiled, or roasted	1	2	3	4	5	6	8

Meat, Poultry, Fish, and Meat Alternatives Continued

Food Item	How Often Do You Eat The Food						
Ground turkey	1	2	3	4	5	6	8
Fried fish	1	2	3	4	5	6	8
Fish sticks or cakes	1	2	3	4	5	6	8
Other seafood - shrimp, crabs, oysters	1	2	3	4	5	6	8
Tuna fish	1	2	3	4	5	6	8
Pork or beef liver	1	2	3	4	5	6	8
Hot dogs	1	2	3	4	5	6	8
Polish or Italian sausage	1	2	3	4	5	6	8
Liverwurst	1	2	3	4	5	6	8
Lunch meats	1	2	3	4	5	6	8
Neck bones or ham hock	1	2	3	4	5	6	8
Chitterlings	1	2	3	4	5	6	8
Pig's feet	1	2	3	4	5	6	8
Bacon	1	2	3	4	5	6	8
Breakfast sausage links or patties	1	2	3	4	5	6	8
Turkey bacon or sausage	1	2	3	4	5	6	8
Peanut butter or peanuts	1	2	3	4	5	6	8
Other nuts - cashews, sunflower seeds	1	2	3	4	5	6	8
Eggs	1	2	3	4	5	6	8
Chili	1	2	3	4	5	6	8
Black-eyed peas	1	2	3	4	5	6	8
Beans - baked, pinto, kidney, lima, navy	1	2	3	4	5	6	8

1. How many meats do you usually eat per day? _____
   (Number of meats)

2. How often do you:

	1 Always	2 Sometimes	3 Never
a. Fry your meat?	_____	_____	_____
b. Roast, broil, bake, or boil meat?	_____	_____	_____
c. Choose lean or low fat meats?	_____	_____	_____
d. Eat the fat on meat?	_____	_____	_____
e. Eat the skin on chicken?	_____	_____	_____
f. Eat beans or peas instead of meat?	_____	_____	_____

Breads and Cereals

Food Item	How Often Do You Eat The Food						
White bread	1	2	3	4	5	6	8
Dark bread - wheat, rye	1	2	3	4	5	6	8
Rolls or biscuits	1	2	3	4	5	6	8
Muffins	1	2	3	4	5	6	8
Cornbread	1	2	3	4	5	6	8
Bagels	1	2	3	4	5	6	8
Hamburger or hot dog buns	1	2	3	4	5	6	8
Crackers	1	2	3	4	5	6	8

Breads and Cereals Continued

Food Item	How Often Do You Eat The Food						
Pancakes or waffles	1	2	3	4	5	6	8
Cereals like Corn Flakes or Rice Crispies	1	2	3	4	5	6	8
Sweet cereals like Frosted Flakes	1	2	3	4	5	6	8
Cereals like Shredded Wheat or All Bran	1	2	3	4	5	6	8
Oatmeal	1	2	3	4	5	6	8
Cream of Wheat	1	2	3	4	5	6	8
Grits	1	2	3	4	5	6	8
Rice	1	2	3	4	5	6	8
Spaghetti	1	2	3	4	5	6	8
Macaroni without cheese	1	2	3	4	5	6	8
Egg noodles or Oodles of Noodles	1	2	3	4	5	6	8

1. How many breads and cereals do you usually eat per day? _____
(Number of breads and cereals)

Mixed Foods

Food Item	How Often Do You Eat The Food						
Pizza	1	2	3	4	5	6	8
Macaroni and cheese	1	2	3	4	5	6	8
Cream soups	1	2	3	4	5	6	8
Vegetable or tomato soups	1	2	3	4	5	6	8
Noodle soups	1	2	3	4	5	6	8
Beef stew	1	2	3	4	5	6	8
Pot pie	1	2	3	4	5	6	8
Tacos	1	2	3	4	5	6	8
Lasagna	1	2	3	4	5	6	8
Chicken and dumplings	1	2	3	4	5	6	8
Chicken or turkey and dressing	1	2	3	4	5	6	8

Milk Products

Food Item	How Often Do You Eat The Food						
Whole milk	1	2	3	4	5	6	8
Skim milk, 1% milk or 2% milk	1	2	3	4	5	6	8
Buttermilk	1	2	3	4	5	6	8
Chocolate milk	1	2	3	4	5	6	8
Cottage cheese	1	2	3	4	5	6	8
Hard cheeses like swiss or cheddar	1	2	3	4	5	6	8
Wrapped cheese slices	1	2	3	4	5	6	8
Velvetta or Kraft cheese	1	2	3	4	5	6	8
Pudding or custard	1	2	3	4	5	6	8
Yogurt	1	2	3	4	5	6	8
Ice cream	1	2	3	4	5	6	8
Milk shake	1	2	3	4	5	6	8

1. How many milk products do you usually drink or eat per day? _____
(Number of milk products)

2. Do you ever feel sick after you eat or drink milk products? 1.Yes_____2.No_____

Other Foods

Food Item	How Often Do You Eat The Food						
Fats and Oils							
Butter	1	2	3	4	5	6	8
Margarine	1	2	3	4	5	6	8
Gravies made with meat drippings	1	2	3	4	5	6	8
Liquid oil like vegetable or corn oil	1	2	3	4	5	6	8
Crisco or other shortening	1	2	3	4	5	6	8
Lard	1	2	3	4	5	6	8
Mayonnaise	1	2	3	4	5	6	8
Salad dressing	1	2	3	4	5	6	8
Fatback or salt	1	2	3	4	5	6	8
Sweet and Salty Snacks							
Donut or sweet rolls	1	2	3	4	5	6	8
Cakes, pies and other desserts	1	2	3	4	5	6	8
Jello	1	2	3	4	5	6	8
Cookies	1	2	3	4	5	6	8
Chocolate candy	1	2	3	4	5	6	8
Other candy	1	2	3	4	5	6	8
Pretzels	1	2	3	4	5	6	8
Potato chips	1	2	3	4	5	6	8
Popcorn	1	2	3	4	5	6	8
Condiments							
Jelly or syrup	1	2	3	4	5	6	8
White sugar, brown sugar or honey	1	2	3	4	5	6	8
Mustard	1	2	3	4	5	6	8
Ketchup	1	2	3	4	5	6	8
Barbecue sauce	1	2	3	4	5	6	8
Hot sauce or taco sauce	1	2	3	4	5	6	8
Soy sauce	1	2	3	4	5	6	8
Relish	1	2	3	4	5	6	8
Pickles	1	2	3	4	5	6	8
Beverages							
Regular soda pop	1	2	3	4	5	6	8
Diet soda pop	1	2	3	4	5	6	8
Coffee	1	2	3	4	5	6	8
Decaffeinated coffee	1	2	3	4	5	6	8
Tea - hot or iced	1	2	3	4	5	6	8

Other Foods Continued

Food Item	How Often Do You Eat The Food						
Beverages Continued							
Kool-Aid, Hi-C or Hawaiian Punch	1	2	3	4	5	6	8
Tang or other breakfast drinks	1	2	3	4	5	6	8
Beer	1	2	3	4	5	6	8
Wine	1	2	3	4	5	6	8
Whiskey like rum, vodka or Thunderbird	1	2	3	4	5	6	8
Water	1	2	3	4	5	6	8

1. How many cups of water do you drink a day? _____

2. How often do you:

a. Eat at fast food restaurants like McDonald's, Burger King, or Kentucky Fried Chicken?	1	2	3	4	5	6
b. Add sugar to your food?	1	2	3	4	5	6
c. Add salt to your food?	1	2	3	4	5	6
d. Add pepper to your food?	1	2	3	4	5	6
e. Use herbs & spices in cooking instead of salt?	1	2	3	4	5	6
f. Use fat, oil, butter, or margarine in cooking?	1	2	3	4	5	6

Wait! Don't Start The Next Section Until The Interviewer Tells You To!

SECTION IV: Other Relevant Information

Listen carefully to the directions before you begin this section. Make sure you answer all the questions that apply to you. If you don't have an answer or opinion for a question, write "don't know", "not sure", or "no opinion" on the line. If the question does not apply to you, write "NA" on the line.

A. Nutrition-related Health Problems and Pregnancy

1. Do you have or have you ever had any of these health problems? **(Check all that apply to you.)**

	1 YES	2 NO	8 DON'T KNOW
a. high blood pressure	_____	_____	_____
b. sugar diabetes	_____	_____	_____
c. heart trouble	_____	_____	_____
d. overweight	_____	_____	_____
e. cancer	_____	_____	_____
f. tooth problems	_____	_____	_____
g. stroke	_____	_____	_____
h. bone disease	_____	_____	_____
i. liver disease	_____	_____	_____
j. other health problems? **Write them on this line.**	_____	_____	_____

_____

2. Are you taking medicine for any of these? _____**1.Yes** _____**2.No**

   If yes - For which one(s)?_____

   If you answered yes to any of the problems in number 1, answer number 3.

3. Did you change your diet because of any of these problems? _____**1.Yes** _____**2.No**

   If yes - For which problems did you change your diet?

   _____

   If yes - What changes did you make?

   _____

4. Are you pregnant? _____**1.Yes** _____**2.No**

   If yes - How many months? _____

   Do you plan to breast-feed your baby? _____**1.Yes** _____**2.No**

   If no - Why not?

   _____

B. Perceptions of Health Status and Nutrition Problems

1. About how tall are you without shoes? _____

2. About how much do you weigh? _____

3. Do you consider yourself:

   _____**1.Underweight** _____**2.Overweight** _____**3.Average weight**

4. How would you rate your health right now? Would you say it is:

   _____**1.Excellent** _____**2.Good** _____**3.Fair**_____ **4.Poor**_____ **5.Very Poor**

5. How would you rate the way you eat right now? Would you say the way you eat is:

   _____**1.Excellent** _____**2.Good** _____**3.Fair**_____ **4.Poor**_____ **5.Very Poor**

6. About how much do you know about nutrition? Would you say you know:

   _____**1.A whole lot**_____**2.A lot**_____**3.Some**_____**4.Not too much** _____**5.Almost nothing**

7. What do you think it means to have good nutrition?

   _____

8. What do you think it means to have a nutrition problem?

   _____

9. Do you or anyone in your family have a nutrition problem?

   _____**1.Yes** _____**2.No** _____**8.Don't Know**

   If yes - What is the problem?

   _____

10. How would you rate the way people in this community eat right now? Would you say the way they eat is:

    _____**1.Excellent** _____**2.Good** _____**3.Fair**_____ **4.Poor**_____ **5.Very Poor**

11. Do you think people in this community have nutrition problems?

    _____**1.Yes** _____**2.No** _____**8.Don't Know**

    If yes - What are they?

    _____

C. Sources of Nutrition Information

1. Where do you get information about nutrition from? Check the line which best says how much nutrition information you get from each of these sources.

	1 A Lot	2 Some	3 None
a. Your doctor	_____	_____	_____
b. Other health professionals - nurses, dieticians	_____	_____	_____
c. Hospital or clinic	_____	_____	_____
d. Newspaper	_____	_____	_____
e. Magazines	_____	_____	_____
f. Books	_____	_____	_____
g. Health pamphlets	_____	_____	_____
h. Television shows	_____	_____	_____
i. Television commercials	_____	_____	_____
j. Radio shows	_____	_____	_____
k. Radio commercials	_____	_____	_____
l. Family members	_____	_____	_____
m. Friends	_____	_____	_____
n. School (where you or your child go)	_____	_____	_____
o. Work	_____	_____	_____
p. Community organizations	_____	_____	_____
q. Church	_____	_____	_____
r. Health department	_____	_____	_____
s. MLB Building	_____	_____	_____
t. WIC Program	_____	_____	_____

2. From which of these sources do you get the **most** nutrition information?_____

D. Food Purchasing Issues

1. Who or what influences your decisions the **most** about the kind of food you buy and eat?

_____

2. Where do you do most of your grocery shopping?

_____

3. Do you ever read the labels on foods when you shop?
   ____**1.Always**____**2.Sometimes**____**3.Never**

   Do you understand the labels? _____**1.Yes**_____**2.No**_____**3.Sometimes**

   Do they help you select foods? _____**1.Yes**_____**2.No**_____**3.Sometimes**

4. How much do you spend a month on food?_____

5. When you shop, do you use: _____**1.Cash**_____**2.Food stamps**____**3.Both**

E. Food Assistance Programs

1. Are you a member of:____**1.WIC**____**2.Food Stamp Program**____**3.Agricultural Extension**

   Other Food Programs? _____

2. Are your children in the school lunch or breakfast program?

   _____**1.Yes**_____**2.No**____**3.Does Not Apply**

3. Do you ever have to get emergency food? ___**1.Yes**___**2.No** **If yes, answer these questions.**

   a. How often? _____
   b. From whom? _____
   c. For what reason(s)? _____

F. Nutrition Education Program Needs

1. If a nutrition education program was planned for this community:

   a. Would you come? _____ **1.Yes**_____**2.No**_____**8.Don't Know**

      If no - Why not? _____

   b. Where should it be held?

      _____

   c. What time of day and day of the week should it be held?

      _____

   d. How should we tell people about it?

      _____

   e. What do we need to do to get people to come?

      _____

   f. What should we talk about?

      _____

2. What kind of help do you need to learn more about nutrition, so you can improve the way you and your family eat?

   _____

Thank you very much for taking the time to answer this long survey. Your answers will help us to plan the right kind of nutrition program for this community.

SOURCES OF ITEMS ADAPTED FOR USE IN NUTRITION EDUCATION SURVEY INSTRUMENT

Section/Item #/Concept	List of References Source
Knowledge Test - Multiple Choice Section	
#46	The Pennsylvania State University, 1978a
#49	White, 1988
#50	White, 1988
#62	White, 1988
Knowledge Test - Most Foods Section	
Stems for each category	National Dairy Council, 1979
Beliefs Scale	
#23	Champion, 1984
#38	Champion, 1984
#43	Champion, 1984
#3	Cockburn, Takey, & Sanson-Fisher, 1987
#53	Eisen & Zellman, 1986
#4	Gillium & Gillium, 1984
#10	Given et al., 1982
#30	Given et al., 1982
#46	Given et al., 1982
#48	Given et al., 1982
#49	Given et al., 1982
#42	Jette et al., 1981
#19	National Health Promotion Campaign, 1986
#34	The Pennsylvania State University, 1978b

SOURCES OF ITEMS ADAPTED CONT.

Section/Item #/Concept	List of References Source
Dietary Intake	
Majority of food frequency listing	Block, 1986
No. of each food group a day	Block, 1986
"How often do you" lists for food groups	Block, 1986
"How often do you" questions at end	Block, 1986
Regional foods in food frequency	Taylor, 1975
Other Relevant Information	
Section B. - #6	Food and Drug Administration, 1974
Section B. - #1 - 3	National Health Promotion Campaign, 1986

APPENDIX F

RESULTS OF THE NUTRITION KNOWLEDGE TEST

PERCENTAGES FOR ITEMS IN THE FOOD GROUPS SECTION

Item #	Fruit 1	Veg 2	Meat 3	Milk 4	Bread 5	Other 6	DK[a] 8	NR[a] 9
1	9	89*	1	0	0	0	0	1
2	1	3	1	4	89*	1	1	0
3	3	4	6	61	2	16*	5	3
4	2	1	92*	2	1	1	0	1
5	3	11	9	18	31*	21	5	2
6	3	92*	1	2	1	0	0	1
7	0	2	10	83*	1	2	0	2
8	90*	4	3	1	0	0	1	1
9	2	0	1	4	76*	10	6	1
10	3	1	4	30	3	45*	11	3
11	88*	8	0	0	0	1	1	2
12	9	0	1	77*	3	6	3	1
13	0	3	94*	1	0	1	0	0
14	2	2	15	2	1	55*	22	1
15	6	84*	0	0	4	1	1	4
16	76*	12	0	1	0	5	5	1
17	2	0	3	3	34	51*	5	2
18	0	2	91*	3	1	1	0	2
19	11	0	0	46*	5	28	9	1
20	2	13	2	0	7	64*	11	1

Note. n = 100. Asterisk indicates the correct response.

[a]DK = don't know; NR = no response, as well as the very small percentage of dual responses.

PERCENTAGES FOR ITEMS IN THE MOST FOODS SECTION

Item #	1	2	DK	NR
21	97*	2	0	1
22	82*	9	1	8
23	3	89*	0	8
24	64*	29	1	4
25	85*	6	1	8
26	97*	1	1	1
27	4	94*	0	2
28	67*	16	10	7
29	31	62*	3	4
30	91*	5	1	3
31	89*	4	3	4
32	92*	2	4	2
33	6	80*	7	7
34	75*	16	5	4
35	9	83*	3	5
36	85*	7	4	4
37	33	47*	14	6
38	5	82*	8	5
39	24	61*	11	4
40	42*	45	8	5
41	6	87*	2	8
42	85*	6	2	7
43	81*	8	5	6
44	9	80*	3	8
45	78*	10	3	9

Note. n = 100. Asterisk indicates the correct response. Number corresponds to food set choices.

PERCENTAGES FOR ITEMS IN THE MULTIPLE CHOICE SECTION

Item #	1	2	3	4	DK	NR
46	4	0	63*	24	9	0
47	44*	0	42	2	12	0
48	11	1	2	80*	6	0
49	27	20	16*	8	29	0
50	5	8	2	84*	1	0
51	9	3	67*	4	17	0
52	4	74*	11	5	3	3
53	8	25*	13	32	22	0
54	2	10	17	62*	8	1
55	9	72*	4	2	12	1
56	5	83*	1	2	8	1
57	17	13	50*	10	9	1
58	61*	12	0	0	26	1
59	6	6	2	67*	17	2
60	64*	7	6	4	17	2
61	10	2	71*	8	7	2
62	10	66*	6	6	11	1
63	7	62*	8	10	13	0
64	71*	2	10	6	11	0
65	68*	9	2	9	12	0
66	3	62*	7	18	10	0
67	82*	3	2	2	4	1
68	24	0	56*	3	17	0
69	9	5	3	75*	8	0
70	16	11*	16	12	45	0

MULTIPLE CHOICE SECTION CONT.

Item #	1	2	3	4	DK	NR
71	6	2	5	62*	25	0
72	54	1	31*	10	4	0
73	1	71*	17	5	5	1
74	35	4	18	25*	16	2
75	12	6	5	66*	9	2

Note. n = 100. Asterisk indicates the correct response. The number corresponds to the distractors.

APPENDIX G

RESULTS OF THE NUTRITION BELIEFS SCALE

PERCENTAGES FOR NUTRITION BELIEFS SCALE ITEMS

Item #	RA[a] 5	A 4	US 3	D 2	RD 1	NR	Item Mean	SD
1	71*	21	3	2	1	2	4.62	.74
2	47*	35	13	2	1	2	4.27	.85
3	47*	30	14	3	4	2	4.14	1.05
4	6	6	27	31	27*	3	3.74	1.25
5	60*	22	5	3	7	3	4.33	1.26
6	23*	41	18	9	6	3	3.71	1.17
7	51*	37	4	3	2	3	4.39	.90
8	8	10	7	45	28*	2	3.77	1.21
9	52*	34	6	3	3	2	4.31	.95
10	15	21	8	37	17*	2	3.20	1.37
11	16	6	6	20	49*	3	3.88	1.59
12	20*	18	28	22	10	2	3.16	1.27
13	52*	31	10	4	1	2	4.31	.89
14	9	11	14	33	30*	3	3.71	1.38
15	10	11	14	35	26*	4	3.69	1.49
16	23*	26	26	10	12	3	3.41	1.30
17	47*	34	11	2	4	2	4.40	1.00
18	52*	29	9	2	6	2	4.21	1.10
19	53*	32	5	4	4	2	4.29	1.03
20	44*	36	8	2	8	2	4.08	1.16
21	14	27	8	32	17*	2	3.11	1.37
22	46*	41	7	1	2	3	4.37	.95
23	30*	48	9	6	5	2	3.93	1.06
24	50*	33	10	4	1	2	4.30	.89
25	26*	32	12	15	12	3	3.53	1.47

PERCENTAGES FOR NUTRITION BELIEFS CONT.

Item #	RA[a] 5	A 4	US 3	D 2	RD 1	NR	Item Mean	SD
26	14*	35	24	16	9	2	3.28	1.18
27	9	12	7	42	28*	2	3.69	1.26
28	36*	38	10	7	6	3	4.00	1.26
29	57*	25	5	7	3	3	4.34	1.17
30	8	15	8	42	25*	2	3.60	1.26
31	53*	36	5	1	3	2	4.39	.87
32	64*	21	9	2	2	2	4.46	.90
33	10	26	18	29	13*	4	3.21	1.49
34	44*	37	12	2	3	2	4.19	.95
35	41*	32	13	4	7	3	4.04	1.28
36	20	8	8	26	35*	3	3.55	1.64
37	13	19	10	28	28*	2	3.40	1.42
38	22*	42	13	14	7	2	3.59	1.19
39	18*	35	24	12	9	2	3.42	1.19
40	54	30	8	4	2	2	4.33	.94
41	7	13	19	3	27*	3	3.65	1.34
42	12	12	13	27	34*	2	3.60	1.39
43	43*	19	17	9	10	2	3.78	1.37
44	9	18	14	22	35*	2	3.54	1.40
45	46*	30	12	7	3	2	4.11	1.07
46	12	16	13	38	19*	2	3.37	1.30
47	33*	46	9	6	3	3	4.08	1.10
48	43*	38	14	3	0	2	4.23	.81
49	7	15	10	35	30*	3	3.73	1.37
50	9	10	7	29	43*	2	3.89	1.32

PERCENTAGES FOR NUTRITION BELIEFS CONT.

Item #	RA[a] 5	A 4	US 3	D 2	RD 1	NR	Item Mean	SD
51	10	12	17	31	28*	2	3.56	1.30
52	61*	28	6	2	1	2	4.49	.79
53	28*	39	14	12	5	2	3.71	1.18
54	30*	25	24	15	3	3	3.71	1.28
55	35*	35	18	8	2	2	3.92	1.07
56	37*	44	14	2	1	2	4.13	.88
57	18*	31	25	13	11	2	3.33	1.24

Note. n = 100 (98 for item means, as two subjects did not answer this section). Asterisk indicates the desired direction of response.

[a]RA = really agree; A = agree; US = not sure; D = disagree; RD = really disagree; NR = no response or multiple responses.

APPENDIX H

RESULTS OF FOOD FREQUENCY

INTAKE OF FRUITS

	Frequency of Consumption (%)							
Food Item	Daily	3-4x a Week	1-2x a Week	1-2x a Month	1-2x a Year	Never Eat/ Don't Like	Don't Know the Food	No Response[a]
Apples or applesauce	10	18	26	26	10	5	1	3
Pears	5	9	11	33	19	16	2	5
Bananas	17	25	20	25	5	4	0	4
Peaches, apricots, nectarines	8	6	17	31	20	9	4	5
Cantaloupe (in season)	8	8	11	30	18	18	2	5
Watermelon (in season)	6	10	14	29	23	11	3	4
Strawberries (in season)	7	10	14	28	24	7	3	7
Berries or fruit cocktail	6	11	17	25	18	15	1	7
Pineapple	10	8	13	25	20	13	5	6
Prunes	8	10	7	9	17	40	4	7
Grapes	10	17	21	23	14	8	1	6
Raisins	13	10	15	20	20	14	2	6
Oranges or grapefruit	16	20	23	19	10	6	1	5
Orange or grapefruit juice	20	19	15	16	10	9	2	9
Other fruit juices like apple, grape	14	17	22	18	10	12	2	5

Note. $n = 100$. Three subjects did not answer this section.

[a]Includes no response to the item or section, multiple responses, and nonsensical responses.

INTAKE OF VEGETABLES

Food Item	Frequency of Consumption (%)							
	Daily	3-4x a Week	1-2x a Week	1-2x a Month	1-2x a Year	Never Eat/ Don't Like	Don't Know the Food	No Response[a]
Green beans or string beans	11	30	26	18	2	8	2	3
Green peas	7	22	24	20	8	15	1	3
Corn	6	30	30	17	5	5	3	4
Squash	5	3	7	11	15	44	8	7
Okra	3	9	16	22	17	26	7	5
Tomatoes or tomato juice	14	17	16	18	6	21	2	6
Beets	4	6	7	18	10	45	4	6
Broccoli	10	16	27	15	6	18	3	5
Cauliflower	6	7	14	16	9	42	3	3
Brussels sprouts	3	6	9	11	15	44	4	8
Cabbage	7	15	21	26	11	12	3	5
Cole slaw or sauerkraut	7	8	16	29	14	18	1	7
Greens (turnips, mustard, collards)	11	24	21	19	7	10	2	6
Spinach	5	20	22	21	5	20	4	3
Lettuce salad	16	19	17	19	8	14	3	4
Carrots	7	10	15	25	15	22	2	4
Green pepper	6	14	17	16	14	28	1	4

INTAKE OF VEGETABLES CONT.

	Frequency of Consumption (%)							
Food Item	**Daily**	**3-4x a Week**	**1-2x a Week**	**1-2x a Month**	**1-2x a Year**	**Never Eat/ Don't Like**	**Don't Know the Food**	**No Response[a]**
Onions	14	25	23	12	5	16	1	4
Celery	8	15	18	23	13	18	1	4
Fried potatoes or french fries	14	16	28	22	10	5	1	4
Baked potato	17	17	27	24	9	1	0	5
Mashed potatoes	14	19	26	21	9	4	3	4
Sweet potatoes or yams	3	4	16	29	20	21	4	3
Potato salad	4	10	16	29	19	16	2	4

Note. n = 100. Three subjects did not answer this section.

[a]Includes no response to the item or section, multiple responses, and nonsensical responses.

INTAKE OF MEATS AND MEAT ALTERNATIVES

	Frequency of Consumption (%)							
Food Item	**Daily**	**3-4x a Week**	**1-2x a Week**	**1-2x a Month**	**1-2x a Year**	**Never Eat/ Don't Like**	**Don't Know the Food**	**No Response[a]**
Beef - roast or steak	9	16	27	27	1	3	0	17
Hamburger or cheeseburger	5	20	31	20	2	3	1	18
Ground beef or meat loaf	5	14	30	27	2	2	1	19
Barbecue ribs	2	4	11	38	19	8	1	17
Pork chops or roast	0	5	28	29	11	9	0	17
Ham	1	5	11	33	22	10	1	17
Veal	1	1	9	7	15	43	8	16
Lamb	2	1	3	8	8	55	3	18
Fried chicken	14	19	15	18	6	8	2	18
Chicken or turkey baked, broiled, or roasted	5	12	18	18	15	11	2	19
Ground turkey	1	5	11	12	8	37	8	18
Fried fish	5	11	17	20	17	11	0	19
Fish sticks or cakes	1	5	17	16	15	25	1	20
Other seafood - shrimp, crabs, oysters	3	6	12	21	12	27	2	17
Tuna fish	3	9	19	29	5	16	0	19
Pork or beef liver	1	4	13	23	23	17	2	17
Hot dogs	2	12	26	26	10	5	1	18

INTAKE OF MEATS CONT.

	Frequency of Consumption (%)							
Food Item	Daily	3-4x a Week	1-2x a Week	1-2x a Month	1-2x a Year	Never Eat/ Don't Like	Don't Know the Food	No Response[a]
Polish or Italian sausage	1	5	11	24	14	29	0	16
Liverwurst	1	3	3	5	19	44	9	16
Lunch meats	10	10	25	20	8	9	1	17
Neck bones or ham hock	0	5	16	28	15	16	3	17
Chitterlings	1	1	3	12	30	33	3	17
Pig's feet	1	2	2	8	24	41	4	18
Bacon	11	17	18	19	6	9	1	19
Breakfast sausage links or patties	7	19	21	20	6	11	0	16
Turkey bacon or sausage	3	8	14	14	8	31	6	16
Peanut butter or peanuts	10	12	15	24	8	13	2	16
Other nuts	3	10	18	18	16	18	0	17
Eggs	12	17	19	19	7	7	1	18
Chili	0	3	24	31	16	10	1	15
Black-eyed peas	2	4	9	24	24	20	0	17
Beans - baked, pinto, kidney, lima, navy	4	9	24	29	9	6	3	16

Note. n = 100. Three subjects did not answer this section. Twelve subjects' responses were deleted due to a questionable response pattern (e.g., circling #1 or #7 for all food items. [a]Includes no response to the item or section, multiple responses, nonsensical responses, and deleted responses.

INTAKE OF BREADS AND CEREALS

	Frequency of Consumption (%)							
Food Item	**Daily**	**3-4x a Week**	**1-2x a Week**	**1-2x a Month**	**1-2x a Year**	**Never Eat/ Don't Like**	**Don't Know the Food**	**No Response[a]**
White bread	44	8	15	6	2	12	0	13
Dark bread - wheat, rye	15	15	19	13	5	19	1	10
Rolls or biscuits	7	19	25	20	10	5	1	13
Muffins	4	10	21	19	13	18	1	14
Cornbread	6	16	18	26	11	6	1	16
Bagels	3	2	1	15	11	43	6	19
Hamburger or hot dog buns	8	16	19	27	6	10	0	13
Crackers	8	12	35	23	4	3	0	15
Pancakes or waffles	6	8	18	32	9	6	0	13
Cereals like Corn Flakes or Rice Crispies	10	16	21	22	8	9	0	14
Sweet cereals like Frosted Flakes	9	14	11	22	7	22	1	14
Cereals like Shredded Wheat or All Bran	2	2	12	13	12	40	2	17
Oatmeal	10	10	11	22	10	19	1	17

INTAKE OF BREADS AND CEREALS CONT.

	Frequency of Consumption (%)							
Food Item	**Daily**	**3-4x a Week**	**1-2x a Week**	**1-2x a Month**	**1-2x a Year**	**Never Eat/ Don't Like**	**Don't Know the Food**	**No Response[a]**
Cream of Wheat	3	7	18	17	7	32	1	15
Grits	10	11	19	24	8	13	1	14
Rice	4	12	28	24	7	9	0	16
Spaghetti	3	11	25	31	4	7	2	17
Macaroni without cheese	1	7	15	18	7	30	5	17
Egg noodles or Oodles of Noodles	2	9	20	26	8	18	3	14

Note. n = 100. Three subjects did not answer this section. Ten subjects' responses were deleted due to a questionable response pattern (e.g., circling #1 or #7 for all food items).

[a]Includes no response to the item or section, multiple responses, and nonsensical responses.

INTAKE OF MILK AND MILK PRODUCTS

	Frequency of Consumption (%)							
Food Item	Daily	3-4x a Week	1-2x a Week	1-2x a Month	1-2x a Year	Never Eat/ Don't Like	Don't Know the Food	No Response[a]
Whole milk	31	12	11	12	3	18	2	11
Skim milk, 1% milk or 2% milk	12	15	9	18	6	25	3	12
Buttermilk	2	7	10	7	11	47	2	13
Chocolate milk	4	3	10	23	22	24	1	13
Cottage cheese	2	8	12	20	10	34	2	12
Hard cheeses like swiss or cheddar	6	12	14	22	10	19	0	17
Wrapped cheese slices	12	18	19	22	4	13	0	12
Velvetta or Kraft cheese	7	21	22	21	7	10	0	12
Pudding or custard	3	6	9	27	18	25	0	11
Yogurt	4	3	10	21	12	33	2	15
Ice cream	9	14	28	26	8	3	0	12
Milk shake	5	9	14	27	19	14	0	12

Note. n = 100. Three subjects did not answer this section. Eight subjects' responses were deleted due to a questionable response pattern (e.g., circling #1 or #7 for all food items).

[a]Includes no response to the item or section, multiple responses, and nonsensical responses.

INTAKE OF MIXED FOODS

	Frequency of Consumption (%)							
Food Item	Daily	3-4x a Week	1-2x a Week	1-2x a Month	1-2x a Year	Never Eat/ Don't Like	Don't Know the Food	No Response[a]
Pizza	7	9	20	32	12	7	0	13
Macaroni and cheese	4	12	28	28	8	7	0	13
Cream soups	1	6	8	17	14	36	4	14
Vegetable or tomato soups	3	8	7	27	13	26	2	14
Noodle soups	2	8	12	29	14	19	3	13
Beef stew	2	3	17	41	10	9	1	17
Pot pie	1	6	9	30	16	19	5	14
Tacos	2	4	16	26	15	19	2	16
Lasagna	1	5	5	21	26	28	0	14
Chicken and dumplings	0	2	10	26	29	18	1	14
Chicken or turkey and dressing	2	1	7	23	42	10	2	13

Note. n = 100. Three subjects did not answer this section. Ten subjects' responses were deleted due to a questionable response pattern (e.g., circling #1 or #7 for all food items).

[a]Includes no response to the item or section, multiple responses, and nonsensical responses.

INTAKE OF OTHER FOODS

	Frequency of Consumption (%)							
Food Item	Daily	3-4x a Week	1-2x a Week	1-2x a Month	1-2x a Year	Never Eat/ Don't Like	Don't Know the Food	No Response[a]
Fats and Oils								
Butter	27	14	20	10	5	13	2	9
Margarine	25	18	28	11	3	6	0	10
Gravies made with meat drippings	6	7	11	24	17	25	0	10
Liquid oil like vegetable or corn oil	13	14	22	20	8	13	0	10
Crisco or other shortening	17	18	15	15	9	13	2	11
Lard	4	2	8	10	9	50	7	10
Mayonnaise	16	18	17	9	8	21	1	10
Salad dressing	9	8	22	26	9	13	1	12
Fatback or salt pork	12	6	9	21	14	26	2	10
Sweet and Salty Snacks								
Donuts or sweet rolls	12	12	13	24	17	13	0	9
Cakes, pies and other desserts	10	4	22	30	14	10	0	10
Jello	9	11	16	27	18	8	0	9

INTAKE OF OTHER FOODS CONT.

Food Item	Frequency of Consumption (%)							
	Daily	3-4x a Week	1-2x a Week	1-2x a Month	1-2x a Year	Never Eat/ Don't Like	Don't Know the Food	No Response[a]
Sweet and Salty Snacks Cont.								
Cookies	13	9	16	30	12	10	1	9
Chocolate candy	10	3	13	31	13	21	0	9
Other candy	11	8	14	22	16	17	1	11
Pretzels	4	0	9	17	16	42	0	12
Potato chips	11	13	12	34	10	10	0	9
Popcorn	12	14	16	29	10	9	0	10
Condiments								
Jelly or syrup	9	10	24	16	11	21	0	9
White or brown sugar, honey	15	11	19	20	7	17	0	9
Mustard	16	20	22	18	9	4	0	9
Ketchup	13	19	23	19	6	11	0	9
Barbecue sauce	7	12	25	29	7	10	0	10
Hot sauce or taco sauce	9	13	22	14	9	23	0	10
Soy sauce	5	3	5	21	14	43	0	9
Relish	2	4	9	25	9	41	0	10
Pickles	9	12	18	32	9	11	0	9

INTAKE OF OTHER FOODS CONT.

	Frequency of Consumption (%)							
Food Item	**Daily**	**3-4x a Week**	**1-2x a Week**	**1-2x a Month**	**1-2x a Year**	**Never Eat/ Don't Like**	**Don't Know the Food**	**No Response[a]**
Beverages								
Regular soda pop	39	14	12	11	5	10	0	9
Diet soda pop	7	6	8	12	7	50	1	9
Coffee	15	7	7	14	9	38	0	10
Decaffeinated coffee	6	4	5	8	8	56	1	10
Tea - hot or iced	16	11	17	14	9	21	0	12
Kool-Aid, Hi-C or Hawaiian Punch	18	11	23	14	9	14	0	11
Tang or other breakfast drinks	10	10	12	14	13	32	0	9
Beer	9	3	5	6	9	59	0	9
Wine	2	2	3	8	13	60	1	11
Whiskey like rum, vodka or Thunderbird	2	2	4	4	12	6	1	11
Water	61	10	3	3	5	7	0	11

Note. n = 100. Three subjects did not answer this section. Six subjects' responses were deleted due to a questionable response pattern (e.g., circling #1 or #7 for all food items).

[a]Includes no response to the item or section, multiple responses, and nonsensical responses.

APPENDIX I

SOURCES OF NUTRITION INFORMATION

SOURCES OF NUTRITION INFORMATION

Sources	% A Lot	% Some	% None	% NR
Doctor	40	40	16	2
WIC program	37	26	34	2
Health department	33	39	25	2
Pamphlets	32	44	21	2
Other health professionals	31	37	28	3
Hospital or clinic	30	41	24	4
MLB building	29	31	36	3
Books	27	48	22	2
Magazines	26	47	24	2
School	23	31	40	5
Newspapers	21	52	23	3
TV shows	21	54	21	3
Family	21	51	24	3
Friends	19	47	28	5
TV commercials	18	48	30	3
Church	16	36	43	4
Community organizations	14	44	38	3
Work	13	31	47	8
Radio shows	11	34	50	4
Radio commercials	10	36	51	2

Note. $n = 85$. One subject did not answer this section. NR = no response and multiple responses.

MAJOR SOURCES OF NUTRITION INFORMATION

Sources	% Most Source	% Total Source[a]
Doctor	36	80
WIC program	27	73
Health department	13	72
Magazines	11	73
Television	8	75
Books	5	75
Other health professionals	5	68
Pamphlets	4	66
Friends	4	63
School	4	54
Work	4	44
Other sources[b]	4	-----
Family	2	72
MLB building	2	60
Newspapers	1	73
Hospital or clinic	1	71
Church	1	52
Multiple most information sources	22	-----

Note. n = 85. One subject did not answer this section. Question not applicable to 3 subjects who reported no source of nutrition information. Eleven subjects did not answer this question.

[a]Reflects the combined percentage for a lot and some information.

[b]Includes: reading, literature (unspecified), myself, from the right foods you eat.

VITA

Carolyn Patricia Parks was born in South Philadelphia, Pennsylvania on September 24, 1954. She graduated from South Philadelphia High School in 1972, and began undergraduate studies in biology at Cheyney State College, Cheyney, PA in 1975 .

In 1976, she transferred to Wheaton College (Illinois) and obtained the B.S. degree in biology in 1981. Carolyn's intent was to pursue a medical career. However, upon "stumbling" across the health education field, she viewed it as being more in line with her personal and professionals goals of assisting the African-American community with its health needs. Hence, she enrolled in the health education program at Western Illinois University in 1982 and obtained the M.S. degree in 1984.

Following completion of the master's degree, she returned to her home town to practice health education as the Program Coordinator for the Southeastern Pennsylvania High Blood Pressure Control Program, Inc. She served in this role until 1987, when she enrolled in the doctoral program in health education at the University of Tennessee at Knoxville, and obtained the Ph.D. degree in 1993.

Carolyn currently is Assistant Professor of Health Education and Coordinator of the graduate program in Community Health at Cleveland State University. Her primary research and practice interest is health education strategies and materials development for populations of color and the disadvantaged. This interest was largely borne out of her personal experiences as a member of a low socioeconomic population of color, and cultivated through training and professional experiences.