THE MODIFICATION AND FIELD TESTING OF THE INSTITUTE OF NUTRITION QUALITY OF LIFE SCALE FOR THE ELDERLY

by

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(ABSTRACT)

The Institute of Nutrition Quality of Life Scale for the Elderly (INQLS) was studied and then modified by the researcher. The new version was referred to as the modified INQLS. In the modified INQLS, nutritional quality of life is defined as the satifactory intake and utilization of nutrients as influenced by social support, financial status, perceived health status (physical, mental and emotional), and physical well-being.

The modified INQLS was pretested in the Petersburg, Virginia area among participants in the Crater Area Agency on Aging program. Field testing of the final modified INQLS was done in Richmond, Virginia, and the New River Valley area of Virginia. Both sheltered and free-living individuals were field tested. In the study, there were 94 respondents (70 women, 24 men) between the ages of 65 and 102.

Statistical analyses of the scores from the modified INQLS included frequencies, correlational analysis, multiple regression equations, and ANOVA. No statistical significance were found between the Nutrition scale score and the

independent variables of Socio-Economic score, Health and Well-Being scale score, Mobility scale score, Emotional scale score, Age, or Sex.

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INTRODUCTION

The quality of life means many things to many people. In the broadest sense, the concept incorporates many aspects of human needs ranging from obtaining food, shelter and clothing to achieving a sense of fulfillment. In the practical sense, discussion of the quality of life usually focuses on a limited aspect of life quality and of a specific group of people (i.e. the elderly). This group is usually identified by well defined socio-demographic and health status characteristics (1).

Various professions and organizations are actively working toward the improvement of health status, housing, and socio-economics. They are also investigating many other areas of social concern which are related to the elderly. Policy planners and makers are searching for ways to retain the acceptable quality of life for future generations, in spite of unknown factors and predictors (2) (3).

According to Sorenson and Peterson the concept of the quality of life in the elderly has been studied and discussed in the United States for approximately forty years, but Denmark has recently become involved in this topic (3). The concept of the quality of life in the elderly is not just an American dream, but an international one. The following countries have reported on the quality of life: Holland, Sweden, Norway, Denmark, Scotland, England, Wales, Canada, Australia, and the United States. Other countries, such as

France, Korea, Mexico, and the Island of Iz, have also contributed information on the quality of life issue, but it was not relevant to this paper.

The situation of long term and continuing care for the elderly has created a world-wide crisis, especially in developing countries. This crisis includes problems with finances, assessing the quality of life, and achieving goals (4).

Medical technology today faces a population which suffers more from chronic disease than from acute illness, especially in the rapidly aging population, in which cure is less of an issue than care. As a result, the improvements in medical technology have little impact on mortality. The quality of life among the chronically disabled becomes a greater public issue as the number of elderly sufferers increases (5).

The assessment of the quality of life (QOL) as a function of nutritional status takes into consideration many aspects: health status, financial status, social status, psychological status, and educational levels. The relevant factors to consider are those related to health as implied by the World Health Organization (WHO) definition, "Health is a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity" (6, p.91). The financial status of an individual may influence nutritional status through the quality and quantity of food they are able to purchase. The social and psychological status of

individuals which includes educational level, social interaction, and social support may also affect their nutritional status. "Health promotion objectives are to improve QOL through advances in medical technology attempting to improve patients independence, maintain and restore normal function, and achieve better health leading to greater happiness and satisfaction" (7, p. 620).

In many clinical trials, measurement of the QOL is a vital part of assessing the effectiveness of treatment. Often a measurement to predict clinically important change is not available. According to Guyatt and his peers, there are several stages in the development and testing of a QOL measure. These stages include: item selection, reduction of the number of items, questionnaire format, pretesting and showing the responsiveness and validity of the instrument. Guyatt et al also states that a QOL index should detect change within subjects over time. Therefore, the size of the variability between subjects is irrelevant, and correlation coefficients may give misleading results (8).

In 1981, Dr. Howard Jacobson director of the Institute of Nutrition in Chapel Hill, N.C. presented a videotape to the North Carolina Senate Agricultural Committee which explained how the resources of the multidisciplinary Institute of Nutrition might best be used. The staffers from the Senate Agricultural Committee stated that they were not interested in supporting the development of a service if it were not low-

cost, fast, simple, interpretable, and related to national efforts (9). Later, Jacobson and McKenzie developed the Institute of Nutrition Quality of Life Scale for the Elderly (INQLS) to measure the nutritional QOL, which takes into account the physical, mental, socio-economic, and perceived health status of the elderly (10). Many QOL scales have been developed, but Jacobson and McKenzie's questionnaire related directly to nutrition. Groups of questions relating to the above areas may be used to measure one concept of health, while a composite of these measures may be used to summarize the nutritional QOL. For this study, the nutritional QOL has been defined as the satisfactory intake and utilization of nutrients as influenced by social support, financial status, perceived health status (physical, mental and emotional), and physical well-being.

Statement of Problem

Currently the INQLS has not been widely tested, and does not adequately cover some of the variables that could affect the nutritional QOL. To improve this assessment tool, modifications and testing were needed, while keeping in mind the requirements of a simple low-cost and interpretable tool.

In preparing the modified INQLS, Andrews' definition of the "level" of life quality was used: "the extent to which pleasure and satisfaction characterize human existence and the extent to which people can avoid the various miseries which are potentially the lot of each of us" (11, p.280). One

question about the QOL issue is whether to use subjective or objective indicators. Subjective indicators are dependent upon the subject's description of his life experience. Ferrans and Powers feel that both subjective and objective indicators should be used to assess QOL in order to measure resources, status, and subjective experience (12). Andrews, too, points out that social indicators may be either subjective or objective, and makes the point that subjective measures, although not perfect, can produce results that have enough validity to make it worthwhile to use them as well as objective measures (11).

In preparing the modified INQLS, both subjective and objective indicators were used. These questions, which provide a mechanism for scoring, can be measured by standardized scales. At present, the survey questions are not weighted. The weighting of these questions remains to be determined. Even so, the instrument was developed to provide scores from which interpretation could be drawn (10).

Jacobson and McKenzie hoped that the original INQLS could be used to help predict the types of intervention programs needed and to justify the need for consumer services to the elderly. It was developed so that professionals and trained volunteers working with the elderly would have a tool to determine whether mild malnutrition exists. Jacobson and McKenzie felt that this survey would be helpful to researchers in both the public and private sector (10). While certainly

useful, Jacobson & Mckenzie's scales seem to need further refinement. Specifically, it did not provide adequate information about factors influencing the nutritional QOL, nor was their survey adequately pretested with an elderly population.

The purpose of this study was to modify Jacobson and McKenzie's INQLS and field test the questionnaire to provide a short and more precise measurement to assess the nutritional QOL in the elderly. If the modified INQLS is used to determine mild malnutrition, the tool could be useful in predicting needed intervention programs and consumer services, and for the allocation of federal, state, and local funding.

REVIEW OF LITERATURE

Definitions of the Quality of Life

Before the QOL criteria are applied as indicators of the outcome of medical treatments, there is a need for a clear understanding of what makes up a better or worse QOL. There is an implicit assumption that one's health, physical environment, quality of housing, and other material circumstances are valid indicators of the QOL (13).

Edlund and Trancredi have suggested that there are as many thoughts about what constitutes the QOL as there are people using the term. The QOL concept, in addition to having a wide range of ideological uses, has many potential abuses. To an increasing number of caregivers it is an important concept which should be measured in order to estimate the effectiveness of treatment or care (5).

According to Ferrans and Powers the QOL is hard to define because different people value different things. An agreed upon QOL definition is still lacking even though many indicators have been suggested for standards. "This deficiency leads to inconsistencies in the interpretation of what actually constitutes quality of life" (12, p. 15).

Edlund and Tancredi indicated that the QOL is hard to define, but believe that it depends on the user and his/her understanding of the term. The perception of the QOL may depend on the individual's social position and political beliefs. They suggest several different meanings for the

term, "quality of life":

1. fulfillment of personal goals;
2. ability to lead a normal life;
3. ability to lead a socially useful life; and also
4. what the individual personally defines it to be (5).

According to Ferrans and Powers, the term "quality of life" entered the American vocabulary between World War II and the era of the Great Society Program of Lyndon B. Johnson. This term was used to stress that "the good life" was more than just material wealth. Since then, the QOL topic has become important in health care and social policy. The QOL issue is cluttered with problems in defining and measuring (12).

According to Schipper and Levitt the hardest part of measuring QOL is in defining what is to be measured. These authors state that it is very important to comprehend the complexity of the term QOL. The QOL is a lifelong variable, which is affected by ongoing events. Schipper and Levitt identify four main areas which are continuously considered to be basic elements of the QOL. These include physical/occupational, psychological state, sociability and somatic discomfort (14).

In our present age, which Smart and Yates call the "environmental age", QOL has become a popular term. The QOL encompasses several functional relationships in the internal

and external environment of people. This overall characterization includes: physical function, symptoms of disease, treatment, occupational and social interactions, and psychological parameters (including moods). This characterization also includes overall assessment of well-being, such as happiness or satisfaction. According to Smart and Yates, in general, the QOL decreases with age, disease, and decreasing socioeconomic status (all of which usually occur with the elderly) (7).

The President's Committee for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research defines QOL as "an ethically essential concept that focuses on the good of the individual, what kind of life is possible given the person's condition and whether that condition will allow the individual to have a life [that he or she views as worth living]" (15, p.2919).

During the 1980's, the concept of the QOL has given rise to more research, controversy, and debate in the field of health care. Until recently only a few researchers had attempted an overall evaluation of physical, psychological, and social impact of disease and its treatment of patients' lives. This probably reflects a lack of consensus with regard to definition, interpretation, and methodology for measurement (16).

Schrier et al in their study of elderly patients with chronic nonspecific lung disease, define the QOL as normal

physical, psychological and social functioning, which is similar to the definition used by other researchers. It also incorporates certain aspects of health as defined by the World Health Organization (17).

For centuries, there has been a debate as to which factors of life may possibly contribute to the QOL (16, 18). Philosophers have tried to characterize QOL in terms of personal happiness (18). Dalkey and Rourke, in 1973, defined the QOL as a person's sense of well-being or his satisfaction/dissatisfaction with life. Their definition also included happiness or unhappiness in dimensions of health, activity, stress, life-goals, self-esteem, depression, social and family support (19). Campbell and his associates in 1976 used marriage, family life, friendships, standards of living, finance, and religion to define the QOL (20). Young and Longmen, in 1983, defined the QOL as the degree of satisfaction with perceived present life circumstances (21). Continuing along the same theme, Goodinson and Singleton stated that a useful theoretical basis for defining QOL is the degree of satisfaction with perceived present life circumstances. Goodinson and Singleton suggested identifying the factors, which are necessary to function as independent and autonomous individuals. They stated that some factors are relevant to everybody and some factors are unique to certain individuals. Goodinson and Singleton suggested the inclusion of the following: freedom of action, a sense of purpose,

achievement in one's work or family life, self esteem, integrity and the fulfillment of some fundamental aspects of biological and psychosocial function in relation to activities of daily living and the maintenance of health (16).

Lewis in 1982 defined the overall QOL as the degree to which one has self-esteem, a purpose in life and little anxiety (22). Hornquist in 1982 defines QOL "as the degree of need-satisfaction with the physical, psychological, social, material and structural areas of life" (23, p.57). Hornquist believes that human needs are the basis for the QOL concept. He defines QOL as the degree of need satisfaction obtained. He identifies six areas of life, both internal and external, in which needs are to be met. These areas are physical, psychological, social, activity, marital, and structural. Needs and their priorities vary according to individual, society, and epoch. QOL studies do not always involve the six areas (23).

Johnson et al defines QOL or life satisfaction as a subjective evaluation of one's objective environment. This objective environment is influenced by past and present life situations. The environment of the elderly affects their QOL and specifies conditions under which important relationships between these conditions and other measured variables can be found. One's ethnic/cultural group may dictate areas which will influence QOL. Identification/awareness of these variables is important in maintaining or improving QOL (24).

According to Cohen, the QOL is based on the capacity of the individual to attain his/her life's plan. Cohen stated that some ideas are valued by all individuals, but some are valued more highly than others. He feels that it would be helpful, if patients stated, prior to surgery, changes hoped for, in order to ascertain to what extent their goals are recognized (25).

Health-Related Quality of Life

The QOL is an all-inclusive and value-driven concept; therefore, it is difficult to recognize the individual parts of the QOL for an entire population. In terms of health measures, the historically accepted standards (life expectancy and mortality rates), are no longer acceptable for measuring the QOL, according to Gooding, Sloan and Amsel (2). The large number of concepts of the QOL and the large number of instruments to measure the QOL have made it hard to make generalizations about the QOL. Furthermore, there are many definitions for the QOL. "Planners with a sound knowledge of the current perception of well-being among the elderly are more likely to design services that promote maintenance or improvement in quality of life rather than those that encourage dependency and limited activity" (2, p.15).

Most health problems in the elderly are chronic rather than acute. Their perception of these health problems may be altered by appropriate interventions (4).

It is hoped that the modified INQLS can be used as a

health care index to detect mild malnutrition. Najman and Levine have stated that health care initiatives may improve QOL (13). Hopefully, action taken as a result of using this tool will bring about an improvement in the QOL.

Kirshner and Guyatt proposed developing an instrument to measure QOL with a specific goal in mind. They felt that current instruments were limited because they were not designed for a specific purpose (26). Another author, Shaw, produced a mathematical equation to determine the QOL. This equation included the patient's natural endowment and the efforts made on his/her behalf by his/her family and society (27).

Patterson feels that we should not be trying to measure the unmeasurable. He believes there is another world of human experience. This world may not lend itself to statistical analysis or be quantifiable, but may have significance in the overall QOL (28).

In studying the elderly, Koening et al demonstrated a positive association between religion and morale in a sample group of the elderly. A correlation between morale and religiosity was seen in spite of varying social support and financial conditions (29).

Sorenson and Pederson conducted a follow-up study of 733 elderly from Copenhagen, Denmark, three years after a social-medical intervention study. Using a modified Cantril ladder (visual analogue) scale to determine the QOL, they determined

that for 50% of the people, the worst thing that could happen to them was bad health. The second and third things most often mentioned were dwelling conditions and contact with relatives. There was no correlation between score on the scale and sex and age. People on the low end of the scale were more likely to be housebound, feeling lonely, living in an institution and having poor subjective health and financial status. Social and economic factors were mentioned in only 6% and 4% of the answers respectively (3).

A study was conducted in a Danish municipality on general and dental health and social support. A total of 198 individuals participated through the use of a standardized interview. Lifestyle was measured by considering the interviewee's participation in social and cultural events; family support was based on frequency of contact; while friend/neighbor support was based on quality of contact. Participants were interviewed about the presence or absence of certain health symptoms. Lifestyle and social support scales were developed. Symptoms of poor health were more frequent among less active people. Thirty six percent of the low activity group had at least 5 symptoms, while only 10% of those in the high activity group did. Symptoms of poor health were seen relatively often in people with poor social support. It appears that non-supportive social support systems increase the risk of ill health (30).

Hearing impairment is one of the most common health

problems among elderly Americans. One fourth of all Americans beyond the age of 65 report hearing problems. "The handicap or burden of illness associated with hearing impairment in the elderly is thought to be considerable, but remains inadequately defined" (31, p.45). Mulrow and coworkers reported that hearing impairment adversely affects the perceived general well-being and physical, emotional, behavioral, and social function of individuals. When testing was done on 472 elderly males at a Veterans Administration Hospital, 106 were found to have a hearing loss. Hearing loss was associated with significant emotional, social, and communication dysfunction. Sixty-six percent of these individuals saw these dysfunctions as severe handicaps, even though their hearing loss was only mild to moderate. The authors felt that adverse dysfunctions were more easily determined with disease specific testing instead of overall testing (31).

Gooding, Sloan, and Amsel studied the relationship between various health and lifestyle factors and the general well-being of elderly Canadians. According to their results, those having few or no physical limitations, or limitations of short duration, were the most likely to have a positive well-being. Reduction in visits to physicians was next in predicting a positive well-being. It appears that physical health is important in predicting well-being in the elderly (2).

research among the physically disabled elderly should not be slighted. They explored the QOL among patients who were discharged from three medical rehabilitation facilities in the Boston area. They found that age (among men), functional capacity, and activity were the best predictors of the QOL. The more active older people with higher functional levels had the higher QOL scores. The QOL scores included: income, age, marital status, and other activities. (social activities outside home, telephone/visiting persons, participating informal organizations, taking care of others, household duties, and studying) (32).

A study was carried out by Gilden and peers to determine the effects of self-monitoring of blood glucose on the QOL in 20 elderly diabetics. A questionnaire about four aspects of diabetes (general factors, diet, medication, and monitoring) was administered. Data were analyzed by comparing elderly self-monitoring blood glucose and those monitoring glycosuria. Individuals who did self monitoring of blood glucose reported better medication compliance. There was no difference between the two groups concerning perceived QOL (33).

McCorvey and his peers tested the effect of Hydrochlorothiazide, Propranolol, and Enalapril (hypertensive drugs) on the QOL and cognitive and motor functions. The study was done on 17 hypertensive patients, age 55 and above. A double-blind, crossover placebo controlled randomized study was done. There was no significant differences in QOL between

those treated with drugs and the placebo group (34).

Schrier and her peers studied the QOL in elderly patients with nonspecific lung disease, in a family practice. The relationship between patients' physical health status and their QOL was studied. QOL was assessed by the Sickness Impact Profile (SIP) and the DAL (a list of daily activities) in seventy patients. Pulmonary function and respiratory status were also assessed. Patients studied were found to be more impaired in psychosocial and physical functioning than were their healthy counterparts. Shortness of breath was strongly related to the patients' QOL. The authors recommend that comprehensive treatment include psychosocial and physical intervention (17).

Hinds conducted a retrospective cross sectional study on 87 people with lung cancer. No single factor was found to contribute substantially to the variance of the reported QOL. They also concluded that the perceived QOL was subjective, changeable, and depends on the situation patient's faced. Researchers and clinicians are showing an interest in the QOL of individuals who are coping with stress which is related to chronic illness or life-threatening illness (which are common in the elderly) (35).

Recently the last year of life has gotten the attention of health-care planners, since such a large portion of Medicare costs are spent on care during the last year of life. Hospice and cancer research have addressed QOL issues in dying

patients and their families in the last days and weeks. However, little attention has been given to the QOL among elderly community residents in the entire last year of life. According to Lawton and co-workers, there is definitely a need to improve the definition of the QOL in both conceptual and empirical terms. The theoretical model used in this study tried to account for many aspects of life that can be evaluated objectively and subjectively. This model of the good life suggests possible areas which might yield a comprehensive picture of QOL in the last year. The information about the last year of life of the patient was obtained from relatives. Even one year before death, subjects in the last year of life group started with lower levels of competence and well-being than did the community control subjects. A clearly downward path was seen in the last year of life group for indicators of physical health. Downward trends were seen for most of the other indicators, but not as marked. These indicators included energy, pain, mental clarity, satisfaction with time use, going to visit family and friends, depression, and interest in the world. As in the case of health status, the declines were significantly greater among last year of life subjects (36).

In the study mentioned above, the most important difference between the elderly in the last year of life (n=200) and the community control subjects who were not in the last years of life (n=150) was in their health status. In 19

out of the 21 health problems listed, the prevalence rate was greater among the last year of life group. Nine of these were statistically significant. Such a major health difference might lead us to expect a lower QOL in last year of life patients (36).

Several key trends which affect the health care environment have been discussed by Finn and Martin. One is ethics and the QOL, and another is the increasing age of the U.S. population. According to Finn and Martin, one of five people in the U.S. will be over 65 by the year 2030. The impact of aging on health care costs is predicted to be staggering. The elderly usually require more frequent and more intensive/expensive care than do younger people. Also, they visit physicians more often, and are hospitalized twice as much, and stay twice as long (37).

According to Stewart, the relationship between depression and medical illness is complicated, especially in the elderly who are hospitalized. Diagnosis in the elderly covers a wide spectrum, both psychiatric and medical. Treatment of depression in hospitalized elderly can be extremely effective, and can improve QOL and decrease the use of health resources (38). According to Tomaiolo, health surveys have demonstrated that the majority of the elderly have more than their share of health problems and usually suffer from some type of chronic disease (39).

Changes in behavior may increase longevity and improve

QOL, if they are made in an individual's later years. Radecki and Cowell have reported that the elderly are less likely than middle-aged people to have harmful health and nutritional habits but they are not as aware of the effects of behaviors on health. Health education and screening by physicians occur less often in the elderly, and may suggest age-related deficits in health promotion and preventive care. Expansions in physicians' efforts which are aimed at these areas could reduce morbidity and improve the QOL among the elderly by delaying the onset of dependency (40).

The idea of the well-being of the elderly had its roots in the early development of gerontology but the concept of systematic, purpose-filled interventions to enhance well-being has emerged recently. Professionals and clinicians who are trained to concentrate on individual intervention are starting to demonstrate that it is never too late in life to benefit from intervention at the personal level. The cost and benefit of interventions in the elderly suggest the need for further investigation if professionals are to be taken seriously with regard to public policy formation (41).

There are several factors which are responsible for the increased risk of drug nutrient interactions in the elderly. The elderly have increased drug use due to chronic health conditions, and they are more likely to have marginal food intakes which are deficient in nutrients. Poor compliance and inappropriate physician prescribing patterns also complicate

the risk of drug-nutrient interactions. There are several drug-nutrient interactions which may change drug effectiveness, which in turn may affect nutritional status (42, 43). To determine which patients are at risk for drug-nutrient interactions, socioeconomic, dietary and clinical factors should be considered. A knowledgeable health care team could intervene properly to prevent a decline in an elderly person's health status to reduce health care costs and possibly improve the QOL (42).

The QOL in elderly patients who are on long-term drug treatments needs to be studied more in depth. According to Bulpitt and associates, diuretic treatment does not seem to grossly impair QOL, while transdermal nitrates does impair the QOL, if used continuously. Antihypertensive drugs vary widely in their effects on the QOL (44).

There are five main types of health problems which make growing old worse than it needs to be. First is Alzheimer's disease, which gradually robs life of all meaning. Osteoarthritis brings almost permanent pain. Osteoporosis causes stumbling, and makes the elderly less active due to fear of falling. The fourth problem is deafness, which isolates people socially. The last problem is incontinence, which is humiliating (45).

Although most patients with hypertension experience only a few symptoms, these symptoms could disturb ADL (activities of daily living) and the ability to function, and subsequently

could affect the QOL measurements. Diagnosis, and possibly the need for therapy (hypertension labeling), may produce symptoms not associated with the disease itself, but which may affect the QOL. Hypertensive patients who practice good nutrition, maintain a good weight, use stress management techniques, and are physically fit tend to show better control of their lives and usually score better on QOL scales. The major area of controversy has been the extent to which subtle adverse effects of treatment alter QOL, whether these effects can be minimized by choice of drug therapy, and whether the effect of drug therapy on QOL affects compliance (46).

The QOL is influenced by one's past and present life situations. According to Johnson et al, many minority elderly have experienced discrimination and social inequality prior to and during the aging years, and therefore, may have less trouble in adjusting to the negative aspects of aging in our society. Due to this situation, the variables associated with QOL may be different from those in the predominant culture. In the non-Indian American population, self-perceived health is the most important factor related to the life satisfaction of the elderly. Elderly American Indians who are in poorer health may have a lower QOL (47).

The QOL has been measured as part of the medical assessment for many years. It is used most often with reference to terminally ill patients, rehabilitation therapies, and elective surgery outcomes. According to

McCorvery and associates, the QOL also refers to disease-related and therapy-related effects on physical symptoms, emotional status, cognitive function, and life satisfaction, in addition to a patient's perceived health status. Often, in clinical settings, the impact of disease or therapy on the patient's QOL will be an important factor in determining which alternative among therapeutic options to use. In some cases, especially in relatively asymptomatic diseases, the immediate benefit of therapy on the QOL is not seen by the patient (46).

According to Wiklund and associates, the QOL concept refers to a collection of subjective experiences which are important in people's lives. There seems to be a consensus that physical health, mental health, well-being, social roles, and physical functioning are essential components of the QOL. Even though there are tools to measure the effects of drug therapy, these do not measure how a patient feels or functions in ADL. Since traditional indicators of health are recognized as limited, the QOL concept has emerged as an important aspect of medical care, for assessing treatment benefits, and for delivering optimal care (48).

The QOL is multifaceted and complex, especially with respect to chronic disease and the elderly. Patients' perceived QOL may be affected by their illness as well as the therapy. The QOL measurement may include ADL, productivity, social role performance, intellectual capacity, emotional stability and satisfaction with life. Rice and Miller feel

the currently available measures of the QOL are inadequate to explain the complexity of age, disease, therapy, and the effects of these factors on satisfaction and QOL. The correlation between social support and life satisfaction in the study by Rice and Miller is consistent with other research reports --the more social contacts a person with chronic disease has, the more positive will be his perceptions of the QOL. There is also a correlation between ADL and the QOL--the less disabled one is, the more positive he/she will perceive his/her QOL to be. In contrast, the more severe the physical symptoms are, the less positive the perceived QOL (49).

As human life-expectancy increases, it is evident that remaining vigorous, free of disability, and maintaining an acceptable QOL, is just as important, or more important, than the absolute number of years achieved. The challenge of growing old involves compensating for physiological changes and diseases. Scientists and clinicians have long sought to produce terminology which would describe successful aging. The term "productive aging" is used in the field of economics, and implies the production of a marketable service or product. This factor may or may not be necessary to maintain a high QOL (50).

A great deal of adaptation and rehabilitation can occur to permit the maintenance of high levels of functioning in a large portion of the elderly in spite of physiological

declines (often disease-related), less than ideal risk factors, and clinically diagnosed diseases. There are several nonphysiological factors which may influence the ability to age effectively and influence the choices which promote that state. On the negative side, we have disease and disability, while on the positive side we have economic well-being, social-support services, availability and access to health services and psychological well-being. Only a small percentage of the overall population aged 65 and older have no disability or chronic conditions. "It is important that scientists and clinicians adopt a unified concept of aging that allows for prevention, treatment, and compensation or rehabilitation with the ultimate goal of developing health care practice and policies that will maximize the quality of life for the largest number of older people" (50, p. 828).

In the United States, the QOL has increased (due to medicine) beyond its capacity to preserve the QOL. Because of this, a larger portion of old age is now spent in chronic illness and misery. "Just as an extension of credit is no guarantee of the ability to pay, so an extension of life is no guarantee of the ability to enjoy it" (45, p. 985). It is estimated by health economists that by 2040, 50% of the health care spending will be done by those over 60 (45).

Most medical care is given to relieve symptoms, improve mental health, restore functioning, and/or reduce pain or discomfort. Such care is justifiable only if it improves the

QOL of patients (or family, friends, or care-givers). Najman and Levine argue that health care must ultimately be evaluated in terms of the impact that therapy has on the QOL. Those activities or procedures which produce the largest improvement should receive the largest support (13).

Obsession to prevent death makes it understandable why physicians often extend life at practically all costs. Beginning with a patient's earliest days, the physician should teach the importance of the QOL as well as the quantity of life. When thinking of a person's life in terms of biographical terms (i.e., achievements, experiences, responsibilities) instead of biological terms (i.e., blips on a hospital scanner), it becomes easier to see when somebody's life is completed (45).

An overall assessment of the findings of health related QOL scales is difficult for several reasons. For instance, some studies only show that certain levels of activity exist at present (not earlier or later). Other studies compare unlike groups of people (i.e., kidney transplants, dialysis patients and those who cannot qualify for transplant). Although a wide variety of studies exists, evidence consistently supports the idea that health care initiatives may improve the QOL (13). The QOL may also be changed by the results of medical care. According to Bergner, the QOL is improved as the gap between desirable health goals and those attained is decreased (51).

The QOL of the individual is of utmost importance when it is realized that therapeutic procedures may potentially cause unpleasant side effects. One needs to remember that the measurement of the impact of therapy is affected by variables such as coping strategies, personality characteristics, nutritional status, and psychological state (16).

The measurement of the QOL is a budding science. At present, it is very fashionable. According to Schipper and Levitt these two do not mix (14). In attempting to use this important and popular concept, we must pace research and development so that empirical testing is not compromised. The current state of the art demands a pragmatic, function oriented approach. It is unlikely that QOL can be measured against external factors. That is, one person's success is another persons's failure. The major significance is not the patient's measured QOL, but the pattern of function or dysfunction over time (14).

Berg, Hallauer, and Berk have emphasized the need to focus on the perceptions of individuals. They feel that there is a need to determine an individual's concerns and how they relate to the QOL. Health status indexes always include activities of daily living and degrees of mobility. However, many other issues which concern the QOL have been ignored. These issues include: mental function, sexual function, hearing, vision, dental disability, pain and discomfort. These minor health care problems increase in significance once more

serious life threatening health care problems are resolved. Many areas of social and physiological functions are substantially affected by health status (52). A check list of 46 items prepared by Najman and Levine contains typical life areas which usually relate to the QOL concept, but the weight and priority attached to any life area are somewhat arbitrary (13).

Slevin et al did a study which involved 108 patients and their doctor filling out a questionnaire simultaneously. An additional 25 patients were evaluated once by five different health professionals who were working on their case. In order to judge whether QOL assessments by health professionals are meaningful and reliable, it is mandatory to look at the correlation between scores obtained by health professionals and patients/clients using the same scale. They found a wide variety of scores produced by the different doctors and health professionals. Slevin and his peers believe doctors cannot adequately measure the QOL in their patients because QOL contains many subjective elements of which the doctor may not be aware (53).

"Quality of life measurements are used to justify or refute different forms of medical treatment; to identify the sequelae of disease or treatment which are resolved by other interventions... judged to be the most cost-effective" (16, p. 327). QOL measures should include a range of components which are known to contribute to the QOL. These measures should be

used at different times during the progression of the illness and should also be based on information provided by the patient (16).

The benefit of medical treatment or therapy in terms of QALYs (Quality Adjusted Life Years) is the weighted sum of all the individual life-years affected by that treatment or therapy. A weight is assigned to each life-year which shows how much QOL would be improved in that particular life-year. The assigned weights are called utility weights, and are obtained from respondents on health-related QOL scales. Nord feels that the validity of QALYs in their present form--as a measure of social benefit is questionable. It has been claimed that numerical measures of health status are meaningless, but Nord feels that people do not think of the QOL in numerical terms, while they do have preferences concerning life-year effects of health care (54).

According to Liang and his associates, whose emphasis was rheumatology, QOL and health status indexes are pushing us toward more rigid and measurable specifics. The authors warn against being obsessed with statistical correctness. Statistical correctness could get in the way of producing measures which are patient-oriented and clinically useful. He feels that a universally acceptable and useful QOL or health status index is probably not feasible. No instrument is perfect, not all costs and benefits are measurable, and functional capacity is not absolute (55).

Schipper et al have stated that medical social scientists are facing major methodological changes in developing QOL measures. First, the investigator must reach a consensus among doctors, nurses, families, patients and others concerned with the patient as to the important factors in the QOL. If patient and health care providers cannot reach a consensus about the definition of parameters and the end points, the proposed index will fail. Second, the index must be compact enough to allow repeated use, but still comprehensive enough to evaluate sufficiently the components of the QOL. Third, each component of the index must be able to be understood by all patients in the study. Fourth, the index must be sensitive enough to detect changes in the overall QOL and in its component factors. Last, it is necessary to compare QOL among patients. A few innovative attempts have been made at health-related QOL assessment, but they have practical or methodological shortcomings (50).

Nutritional Quality of Life

"The American public, health professionals, and professionals, and policy-makers generally agree that nutrition directly effects health" (57, p. 783). With this realization came national goals for the entire population, which include the following: health maintenance, disease prevention, and preservation of the QOL and functional status (57).

With the beginning of the new century, there will be

major demographic changes in the elderly population, which will have a tremendous impact on the needs and usage patterns of the American health care system. In 1988, elderly individuals 65 and older made up 12% of the population, while in 2030, the number is projected to reach 22% (57).

With the increase in percentage of elderly individuals, there will probably be an increased demand for health services. Increased health care costs are also expected. Several recent reports on elderly Americans encourage the use of policy-making to give more attention to health maintenance, illness prevention, and the retention of functional independence (57).

In 1982, 85% of the elderly Americans had chronic conditions and diseases which could not benefit from nutritional intervention. Health professionals seem to realize the importance of nutrition in health and disease, but it is believed that few routinely or systematically seek signs and symptoms of poor nutritional status in the elderly. This appears to be true regardless of the health care setting (57).

The Nutrition Screening Initiative (NSI) is a multidisciplinary project of the American Dietetics Association, the American Academy of Family Physicians, and the National Council on Aging. The NSI is a five year project developed to promote routine nutritional screening in health care and medical settings. The elderly are targeted as the initial focus since they are the most rapidly growing age

group of the U.S. population, and they have a disproportionate number of risks for poor nutritional status. The objectives of the NSI project were to identify potential risk factors of poor nutritional status in the elderly. According to White, dietitians are aware of the wide variety of environmental, social, economic, and additional physiological variables that may adversely affect nutritional status as people age (57).

In February 1990, the NSI commissioned a national study of the elderly which showed that one third of the non-institutionalized elderly live alone, 45% take several prescription drugs which may interfere with appetite and nutrient absorption, 30% skip meals on a daily basis, and 25% have incomes less than $10,000 (58). Any or all of these factors may lead to poor nutritional status.

White et al define a risk factor as a characteristic or event that increases the likelihood that an individual has, or will have, poor nutritional status. They believe that nutritionists are aware of the importance of inappropriate food intake, but feel that they also need to be aware of other factors which have adverse effects on health. Poverty and social isolation also have an impact on nutritional status. White states that routine nutritional interviews should include: level of economic resources, degree of social support, and adequacy of household facilities. Disability and dependence on others have a great impact on the nutritional status, too. This is especially true in older Americans over

80. Chronic disease, especially degenerative ones, have an impact on nutritional status. Subsequent malnutrition may have an impact on the underlying disease. Acute and chronic conditions which make dietary modifications necessary should be evaluated. These conditions may affect eating, and make food purchasing and preparation more difficult. Individual drugs or a combination of drugs may also have a negative impact on nutritional status. White states that chronological age and functional capacity do not always correlate. Functional impairment and progressive disability increase with age, especially in those over 80 (57).

Health professionals need to be alert to subtle indicators of poor nutritional status so that nutritional problems can be prevented or discovered earlier. Frequently elderly individuals only seek medical care during acute illnesses. If the elderly are already malnourished, they are at greater risk of increased morbidity. Late discovery of malnutrition may further increase health risk. Poor nutritional status is often overlooked at the beginning. White et al recognize that, for some conditions or diseases, cure is not possible, but ameliorative or palliative nutritional modifications may still be recommended (57).

Chernoff and Lipschitz reported that dietary histories are part of the elderly nutritional assessment and should be done on a regular basis. Most methods of assessing dietary intake (24-hour recall, food intake records, and calorie

counts) have limitations, especially in the elderly, and according to Chernoff and Lipschitz are frequently inaccurate. They indicated that dietary histories can signal gross nutritional deficits and unhealthy eating practices (59). Tomaiolo stated that elderly individuals needing evaluation of dietary intake require actual nutrient intake and comparison with nutritional requirements. He feels that present methods of getting accurate dietary information from the elderly is less reliable than for younger patients (39).

QOL scales are important in other areas of health promotion, not only in nutrition. For some time now, these scales have been dominated by medical definitions of health, but they should include social, economic, spiritual, and other areas which make life worth living. People in their everyday lives deal with food, while professionals deal with nutrients. When these two things are related to the QOL, things get complicated. Appropriate intake of nutrients leads to better health, and feeling healthy is definitely a component of QOL. However, the intake of certain foods may conflict with a special diet or proper diet. These foods may be greatly enjoyed by the consumer, and their intake will contribute to the QOL, regardless of its long-term impact on health. An individual's intake may include excessive use of a food which gives him/her much pleasure. If encouraged by the dietitian/nutritionist to reduce consumption, the individual may be deprived of one important component of his/her

perceived QOL. Hochbaum presents this question, "If a nutritionist is concerned with improving a client's Quality of Life, what could or would be the decision if it meant allowing (or even encouraging) the client's use of "forbidden foods" (60, p.31)? If the nutritionist can determine a persons values, it is the nutritionist's task to demonstrate that certain health practices (e.g., following sound dietary principles) are likely to help achieve that person's goals (60).

The nutritional status of the elderly person is affected by many subtle changes in addition to overt changes in normal aging. Chronic illness, which is more common in the elderly, eventually impair nutritional status. Besides normal metabolism, there is poor absorption and utilization of specific nutrients due to drugs which are used to treat chronic illnesses (59). Even though caloric needs may decrease with age, nutritional requirements remain basically the same, regardless of age. On the other hand, illness may increase the need for calories to meet metabolic requirements. Nutritional status in the elderly may be influenced by physical conditions, which may lead to anorexia and eventually malnutrition. These physical factors may include: loss of taste and smell, chronic disease, dental problems, poor digestion, drug induced problems, and physical weakness (39). Improper scheduling, erratic compliance, and drug-drug or drug nutrient interactions are some of the methods by which elderly

patients may develop nutritional problems (59).

According to McCauley and Nelson, it is apparent from recent studies that factors such as age, sex, financial status, type of living situation, activity level, and state of health all affect the nutritional status of the elderly, but, at the same time, the nutritional status affects the living situation, activity level and health status. Also, insufficient physical exercise may cause the inhibition or retardation of the assimilation of nutrients (61).

By agreeing on risk factors and major indicators of poor nutritional status, professionals can develop and validate public awareness programs and screening tools. These tools can be used by many different community workers, and health professionals to recognize nutritional problems, find or begin appropriate intervention. Professionals in dietetics should encourage all health care professionals to familiarize themselves with the elderly's circumstances and needs. "The timely, appropriate, and cost-effective delivery of nutritional screening, assessment, and care will improve the health and well-being of this valued segment of the U.S. population" (57, p.786).

The biggest reason for being involved with nutrition screening is that so many elderly people live alone. Healthy food preparation is "less of a ritual" when living alone. According to Kershner, "throwing something together" is often what elderly people choose for themselves. Other issues also

need to be discussed concerning nutrition screening as it relates to the QOL. Loss of spouse, friend, or pet may trigger depression which may lead to loss of appetite or interest in food. Some elderly see leaving their house to go shopping as a chore, and others just are not mobile. Thirteen percent of elderly Americans live below the poverty level. What money is available may go to rent and heat instead of healthy eating. Alcohol is a hidden problem among the elderly, especially when alcohol is substituted for food. Not feeling well or feeling tired decreases the motivation to get out of bed and fix a healthy meal (62).

According to McCauley and Nelson a single factor or a combination of factors can cause malnutrition. For most people, including the elderly, meals are a social occasion. Most elderly people do not enjoy eating alone, are less motivated to prepare adequate meals for themselves, and feel awkward going out to eat by themselves. Depression by itself may limit intake or may be the result of frustration of trying to adjust to the factors mentioned above. Financial problems should be checked into when determining an elderly person's ability to purchase adequate food. Excessive intake of alcohol should be discouraged in the elderly since it is a low-nutrient-dense source of calories. It also may affect thiamin, riboflavin, niacin, pyridoxine, folate, Vitamin A, and iron status (61).

According to Roe, there are many factors which determine

food intake and consequently affect the nutritional QOL. Food preferences in the elderly are determined by family traditions, ethnicity, and by religious or traditional beliefs. With aging, rigidity of food habits usually increases. Religious customs may also determine food choice, which may also be affected by the season (climatic or religious). Food preferences, and therefore nutritional status, are greatly influenced by education. The more educated people are, the more likely they are to have experienced many different foods, and have a broader range of likes and dislikes. Nutrition education may affect food choice. Elderly people who have knowledge of the caloric value and nutrient composition of foods may prefer nutrient dense foods (43).

Situational factors have a large impact on food preference and choice. If financial resources are limited, the elderly will probably choose the cheaper foods. If the food store is a long distance away, and the elderly person has no transportation, then food preference is probably limited to foods that can be easily carried and require no refrigeration. If there are no refrigeration or cooking facilities, all foods must be nonperishable, and must be eaten at room temperature. For elderly individuals living alone or with another elderly person, food selection includes items that are usually sold in small packages. In the case of an elderly person who is disabled, constraints on food choice and preference are

multiple, resulting in a need to select foods that do not require preparation, do not have to be removed from cans, and do not have to be cooked in any way which requires special dexterity. All of these situational factors affect the nutritional QOL (43).

According to Roe, certain medical factors may also affect food intake and therefore the nutritional QOL. If unpleasant symptoms are associated with intake of specific foods or beverages, then these foods or beverages tend to be avoided. Loss of taste, or perversion of taste or smell, which can occur in the elderly, may cause avoidance of certain foods and preference for others. Diets prescribed by physicians may also limit intake. If several diets are combined, food choices may be very limited and lead to malnutrition and poor nutritional status (43).

Reduction of food intake and subsequent poor nutritional QOL may occur when the eating situation is unpleasant or causes distressing symptoms. Some of these factors include: unattractive surroundings, unpleasant company, bad food service, or disturbances during mealtimes. These factors affect food intake and may eventually lead to malnutrition (43).

An important fact to be aware of is that malnutrition may be developing or may already exist in the elderly. Malnutrition does not happen overnight, but happens gradually and slowly and therefore may be overlooked. According to

McCauley and Nelson, nutritional assessments usually include: a review of medical and surgical histories to see if underlying conditions exist which may promote the development of malnutrition, diet histories, clinical examinations to find symptoms of nutrient deficiency, anthropometric measurements, and biochemical tests. The combination of these is certainly the best method for assessing nutritional status, but this is expensive, and involves skilled health professionals (61).

Determining malnutrition in the elderly is difficult because there are no standards which include the physiological changes which occur with the normal aging processes. Many measures which are used to determine nutritional status are not age adjusted. For example, anthropometric measurements are used as one of the components, to determine nutritional status. Anthropometric measurements are limited in their merit since they detect only gross abnormalities in body composition which can be attributed to nutritional deficiencies. By contrast, they do not measure more subtle, subclinical changes that predict ongoing depletion of nutritional stores. Additionally, individuals are compared to the group norms and there are seldom, if any, reliable group norms for healthy, elderly individuals. e.g. relative weight. More important than relative weight (as compared to a standard) is the history of weight change in the elderly individual. The more recent and severe the weight change, the more likely that nutritional status is compromised (59). In

1985, nutritional assessment standards were extrapolated from studies of younger adults. Tomaiolo feels that until better standards are established for the elderly, the standard nutritional assessments should be used cautiously (39).

Nutritional risk factors may be identified by the physician if he recognizes the effects of chronic disease and age-related physiological changes. Chronic diseases, which are more common in the elderly, often complicate the issue of meeting nutritional needs. For example, arthritis and disabilities which come from prior strokes or bone fractures, may hinder feeding and cooking abilities. The most common eating problem in the elderly is poor dentition (61).

In the year 2000, the elderly population is expected to reach 30% of total U.S. population. This increase is due partly to an increase in the average life span. There has been a decline in mortality from heart disease and strokes. Nutrition intervention has helped this decline. Poor nutrition has been a factor in the development of chronic disease, and dietary modification is an important part of the treatment of various chronic and critical diseases. According to Chernoff and Lipschitz, "the maintenance of nutritional status, including energy, protein, vitamin and mineral stores, may be a factor in the susceptibility of the elderly to infectious disease or the ability to recuperate in a timely and appropriate manner from a physiologic insult or stress such as surgery or infection" (59, p.29).

In the long-term care setting, restoring and maintaining optimal nutritional status may improve the QOL in geriatric patients. Elderly individuals are at greater risk for poor nutrition because of age-related physiological and psychosocial changes, in addition to the impact of chronic disease. All of these will have a negative impact on appropriate food intake. Health care workers must recognize nutrition-related problems quickly in order to correct nutrient imbalances and restore nutritional well-being in the elderly (65).

Helping the elderly become or remain nutritionally healthy is achieved by determining the factors which promote malnutrition at the early stages, implement measures to counteract these factors, and continuing nutritional programs indefinitely (61). The modified INQLS will hopefully be used in this first stage.

Chernoff and Lipschitz (59) mention the importance of maintaining good nutritional status while Coons and Reichel (63) state that the purpose of therapeutic intervention is to maximize the strength of the individual person and minimize their deficits. Many researchers have indicated the extensive use of the health care system by the elderly (37, 57, 59, 64). It is hoped that the use of the modified INQLS will aid in determining the elderly individuals' strengths and weaknesses, therefore maximizing their potential. Through testing with scales such as the modified INQLS, it might be possible to

discover mild malnutrition. Early and less extensive intervention (planned programs to maintain good nutrition in the elderly, or further prevent poor nutrition) could be used to help prevent the heavy burden on the health care system by the elderly. The results of the modified INQLS should indicate what health services are needed to bring about "patients' independence, maintain and restore normal functions, and achieve better health" (7, p.620).

Economic Quality of Life

According to Osberg et al, income indirectly affected the QOL of the physically disabled elderly through its impact on activity. They found that those with higher incomes were more active. The association between QOL and income was not clearly understood since men with higher incomes had lower QOL scores. By contrast, women with higher incomes had higher QOL scores (32).

Kirchman and Schulte studied the difference between the morale of the elderly in a sheltered living environment (retirement community) and those elderly living in a traditional community environment. Morale has been well recognized as an indicator of the QOL. Several predictors of morale are: activity level, self-perceived health status, financial security, and living arrangements. They found higher morale among those in the sheltered environments, which he felt was unusual. The demographic characteristics of the two groups were not equally matched. The elderly living in

the sheltered environment were older, had a higher socioeconomic status and higher educational level. The retirement community provided greater levels of morale (because they felt they were being cared for). Higher educational status and probable concurrent financial investment, and life insurance policies would contribute to less financial worries than those in the community (66).

La Puma did an economic analysis using Quality-Adjusted Life-Year (QALY) as a measure of health outcomes. QALY calculations are based on measurements of the value that persons place on expected years of life. QALY's scores can be used to help to differentiate the trade-offs between QOL and additional survival. This represents a true picture of overall health effectiveness of treatment or practice being used (15).

Quality Adjusted Life Years (QALY) proponents hope to use QALY's to help make financial allocation decisions. "QALY is a numerical description of the value that a medical procedure or service can provide to groups of patients with similar medical conditions" (15, p.2917) QALY analysis (in theory) could be used to compare the advantages of financing intervention which is likely to extend the lives of a population, even with high levels of disability and distress, versus another intervention which may not yield as many life years saved but generates higher levels of subjective well-being. Lund said that very specific health care rationing,

with selected funding priorities, had been proposed in Oregon. The state officials of Oregon hoped to begin rationing Medicaid services on July 1, 1990 (67). The scales being used for rationing included "Quality of Well-Being Scale" and the "Well-Years" which are very similar to QALY's. Jennett and Buxton suggest that QALY's should be used as partial clinical considerations concerning the QOL, and used at the bedside (68). One criticism of this statement is that clinical decision-making itself is not an outcome and is not taken into account in QALYs. There are many interactions between patient and physician such as: attention seeking, information, reassurance, encouragement, and permission, which do not result in tangible interventions or easily measurable data (15).

Psycho-Social Quality of Life

According to Holmes, social indicators are objective assessments of external conditions which contribute to QOL. Conversely, psychological indicators are subjective evaluations of life's experiences (18).

Abbey & Andrews conducted a longitudinal study on 675 individuals to determine to what extent stress, external and internal control, social support, performance anxiety, and depression has on the QOL. Stepwise regressions, bivariate analysis and structural modeling were used for analysis. Their research showed strong support for the idea that the perceived QOL is related to psychological concepts. Stress

and depression were related strongly and negatively, while internal control, performance, and social support were related moderately and positively. Individuals who feel happy and unstressed report feeling better about their lives than those who are stressed and depressed. By contrast, those individuals who feel in control of their own lives, who receive social support, or who perform well feel better about their lives (69).

When thinking about the QOL, the use of time should be considered by individuals and as it refers to times of illness and times of health. Ongoing research is being carried out to improve the use of time budget data to determine those activities which best predict well-being. The importance of time use for those in nursing homes lies partially in the allotment of time to ADL, which represents a possible measurement of the QOL throughout life, possibly most specifically for the elderly. "The way that elderly people use their time, and the changes in activity patterns over time can provide meaningful information about health & well being" (70, p.397).

Smith and peers after studying 30 individuals from a senior center and 30 individuals from a nursing home, suggested that time spent in work and leisure contributes to increased life satisfaction in the elderly. In contrast, decreased life satisfaction was seen when people concentrated on rest and daily activities (71).

Johnson et al, carried out a life-satisfaction study on 58 elderly American Indians from two midwestern reservations. According to Johnson et al, general satisfaction is a perceived state of mind, which shows contentment and freedom from anxiety. Even though there is no empirical data, they thought that the basis for the QOL of the elderly American Indian was different from that of the predominant culture. Problems and situations which are caused by aging, even in the prominent culture, are more compounded in minority group members. They experience the devaluation of the elderly as do other Americans in society. Minority groups also experience the economic, social, and psychological burdens of living, in which racial equality is a myth rather than a social policy. According to the National Indian Council on Aging (NICOA), minority elderly are less educated, have less income, suffer more illnesses and earlier deaths, have poorer quality housing, and less choice as to where they live, and overall, have a lower QOL. Existing supportive services are used less by elderly American Indians than by non-American Indian elderly, due to several factors: poverty, rural isolation, lack of transportation, lack of awareness and cultural and linguistic barriers. Those who live alone and show the severest need are less likely to be aware of how to meet their needs (47).

Psychological factors such as: depression, loss of self-esteem, loss of control of ADL, loss of a sense of purpose and

motivation may adversely affect nutritional status (59). According to Tomaiolo, psychological factors may include: depression, lack of socialization, and emotional problems (39). Poor nutritional status may result from loss of appetite, apathy, and disinterest in eating or food preparation. Elderly men, who have lost a spouse seem to have more difficulty than women because they do not know how to cook and may survive on cold cereal, frozen, ready to eat and canned foods. Intake from these foods may not be nutritionally well balanced because cereal and grain products are heavily used. Intake and subsequent malnutrition may also be affected by poor dentition (59).

Holmes' also mentioned that social indicators available are statistics, statistical series, and other forms of evidence which enable clinicians to assess the values and goals of their patients, and to evaluate and determine the impact of specific programs. Two models are presented for the use of these social indicators. The first implies that minority group members find it difficult to meet their needs. The second implies that maladaptive behaviors which relate to decreased QOL may spread rapidly among similar groups of people (18). Some data bases from gerontological research on elderly patients in medical care environments include information concerning religious denomination. However, data bases do not usually include the levels of involvement with the religious community, and religious orientation, which is

relevant to life satisfaction and well-being. This information may help to identify somewhat higher risk individuals who experience difficulties in adapting to changes and tensions related to aging (29). In studying social factors affecting the QOL Najman and Levine found that people with positive attitudes about their marriage, family, peer group situation, and people who have stronger religious commitments also have more stable and predictable life situations. Stability and conformity may help produce happiness and a higher QOL. There is both direct and indirect evidence that happiness, for the most part, is the result of the lack of spread between an individual's expectations and achievements. Also, the smaller the spread the greater the level of subjectively reported QOL. The major causes of high subjective QOL appear to be positive, close and stable social relationships (13).

Victor, Vetter and Jones agreed with Jacobson and Mckenzie's factors (physical, mental, socioeconomic, perceived health status) and used them in a scale. In addition, they added the degree of satisfaction that an individual feels concerning his or her life and surroundings. Groups of questions about the above characteristics may be used to measure one concept of health while a composite of these measures may give some indication of the sum of their nutritional status (72).

The study on the elderly done by Levitt et al extends the

findings of previous researchers which indicated a relationship between perceived control over life's circumstances and personal well-being. Levitt et al confirmed that a relationship exists between quantity of support and well-being. Overall, those with larger social networks were happier and more satisfied with their environment. The last and most important result of their study supported the often assumed but undocumented differences between the presence of at least one close- support figure or lack of a close-support figure. Those with no close-support figure showed a significantly lower affect than those who reported having one close-support figure. However, those with one support figure did not differ from those reporting multiple close-support figures. It appeared that the presence of one support figure is adequate to sustain affective well-being at the same level as that enjoyed by those with multiple support persons. There is a possibility that individuals satisfied with their lives, who also maintain a higher level of positive affect are more likely to form close relationships. All results of this study are congruent with the view that close personal relationships are associated with the maintenance of effective well-being. These results are preliminary to research concerning which of the various categories of support relationships are more important contributors to personal well-being (73).

Roos and Havens interviewed a group of elderly individuals in 1971, and again in 1983, in order to determine

what factors bring about successful aging, which they define as living to an advanced age, continuing to function well at home, and continuing to remain mentally intact. The original group was made up of 3573 Manitoba, Canada residents aged 65 to 84, while the second group consisted of the survivors of the first group. Those who aged successfully were found to be more satisfied with life than those who did not age well, and also to have used the health care systems less. Even though there were over 100 possible predictors of successful aging studied, only seven were found to be predictive--age, four factors based on health status, two on mental status, and the fact that the individual's spouse had not died or entered a nursing home (74).

Social situations are extremely important among the elderly population and contribute to their nutritional status. Social isolation in the elderly results from a decreasing ability to manage their lives independently. These social situations may include: loss of friends, family or spouse; institutionalization, dependence on fixed income, pensions, or dwindling savings, and depression (59). According to Tomaiolo, social factors include: loss of stable finances, inconvenience and difficulty of food preparation, and faddish nutritional claims and false dietary beliefs (39).

OASIS (Older Adult Service and Information System) is a project developed to respond to the deterioration in the QOL faced by a large number of adults. The project developers

felt that for many older Americans when the demanding responsibilities of job and family are decreased or gone, there is a loss of purpose, a sense of inadequacy, and a lack of self-esteem. Loneliness and boredom only make things worse. The purpose of this project was to help individuals find new interests, and learn new talents and skills. These were used to maintain a higher QOL and to preserve an individual's sense of purpose and self-worth. Mann and coworkers feel that failure of elderly individuals to make use of programs such as OASIS may result in accelerated physical and mental deterioration which will subsequently put heavier demands on social & medical services (75).

Maddox also made several specific recommendations for research, training, and resource development with regard to interventions which enhance the health and well-being of the elderly (41). First, the community and special-environment elderly are appropriate subjects for experimental interventions to enhance their health and well-being. Second, the risk factors idea should be enlarged to include social characteristics (i.e., poverty, ignorance, and isolation, in addition to individual behavior and lifestyle). According to Maddox, these social risk factors relate to the effect of personal characteristics on health and well-being. Third, the concurrent study of environmental and individual characteristics is very important in assessing immediate and long-term effect of interventions which are designed to

enhance the health and well-being of adults. This is of particular importance in research of the elderly because their behavior is more likely to be restrained. Fourth, the varying functional status, and competence between individuals and their environment is especially important in determining behavior in the elderly (41).

A study was done by Johnson et al to ascertain the environmental factors which influence the QOL in minority elderly. American Indians, Blacks, and Jews participated in the study. Data was collected by using the Life Satisfaction Index-Z, OARS Multidimensional Functional Assessment Questionnaire, and the Major Losses Questionnaire. Among the three minority groups, no significant differences were found with regard to life satisfaction. For the American Indians, mental health and education were significantly correlated with QOL. Mental health, activities of daily living, social and economic resources were significantly correlated for the Jewish group, while no variables were significantly correlated for the Black citizens (24).

Quality of Life Indicators

Elderly people who are now nursing home residents or retirement community residents have previously held jobs and had family roles. These jobs and family roles serve as a baseline for determining their wellness or QOL. When individuals are separated from their previous environment (workplace, home or social), traumatic changes in lifestyle

may occur (76). This possibly could affect QOL.

There are several major weakness in using objective indicators as measures of the QOL. First there is a lack of consensus as to what constitutes a high or low QOL. Next, there is a lack of consensus as to which indicators are relevant. There is also very little or no concern to relate input to output, and there seems to be little understanding of the relationship between objective conditions of life and the subjective perception of these conditions (13).

Objective indicators have to be able to identify people with less adequate resources, but they have not been useful in guiding social policy. Objective indicators have four major weaknesses which limit their use. These weaknesses include: vague ideas of the basic dimensions of what constitutes a high or low QOL, much disagreement about which indicators are relevant, little regard or ability to relate input (procedure/intervention) to output, and little understanding of how the objective conditions of life and the subjective perception of those conditions relate to one another (13).

Najman and Levine have indicated that there seems to be little understanding about the relationship between objective conditions in life and the subjective perceptions of individuals. Objective indicators may produce results which are totally unrelated to the feelings and experiences of the individuals being studied. These researchers feel that the results of such studies may be produced by researchers

projecting their own values and priorities on the individuals they are studying (13).

Indicators of perceived well-being provide direct measures of what societies are attempting to achieve and permit cross-sector comparison. These direct measures can also indicate the adequacy of coverage of 'objective' indicators, and can contribute to short and long-term social policy making (11).

Andrews supports the development of measures of people's feelings (perceptual indicators) as valid reflections of society's concerns. The QOL, according to Andrews, is the extent to which pleasure and satisfaction characterize human existence. Without data from perceptual measures, it becomes difficult to determine which possible objective indicators should be measured (11).

Social indicators are sometimes divided into two distinct groups. Subjective measures are based on reports from individuals about their perceptions, feelings, and responses. Objective indicators are based upon counting the occurrences of a given phenomena (11). Campbell feels that subjective indicators directly assess the QOL experience, while objective indicators measure things that influence that experience (77). The overall QOL can be measured by assessing satisfaction. There are differences in the importance of specific aspects which contribute to the QOL (12).

Almost all criteria used in the QOL study are under

substantial criticism. Many studies use only objective indicators, which is insufficient. The criteria being used are inconsistent, but usually try to relate input to output. The most important deficiency is that criteria may be totally unrelated to the feelings and experiences of individuals being studied. The researchers, using subjective social indicators, argue that positive family and social networks are mandatory for happiness and a good QOL. Instruments which exclude these and related ideas lack validity (13).

According to Campbell, we now have an increasing variety of national statistics (mainly objective indicators) which describe events, characteristics or behaviors of individuals as reported through government institutions. These national statistics do not depend on the individual's description of his/her own life. Campbell feels these objective indicators are surrogates for the real thing, and he assumes that most other psychologists believe that the QOL lies in the individual's experience (subjective indicators). Subjective indicators will not have the precision of objective indicators, but they have the advantage of dealing directly with what it is we want to know (the individual's sense of well-being) (77).

Subjective indicators provide a direct measure of an individual's evaluations of his or her own well being. Campbell states that a linkage exists between the response to objective indicators and the individuals' perception of their

Campbell states that a linkage exists between the response to objective indicators and the individuals' perception of their well-being. Subjective indicators allow 'cross sector' comparisons which are needed for resource allocation but are hard to determine with objective measures. A sector which falls below average may merit special attention to decide what caused the poor rating and what improvements might be made (78).

Andrews feels that subjective indicators could come to have a more general, global, and possibly more significant impact than they do at the present. Subjective indicators describe an individual's response to basic human concerns. A corresponding set of subjective indicators, observed in a broad range of countries, could help to demonstrate the commonality of all people. "It is such common understandings of common concerns that generate the support for cooperation and sharing of burdens on which our mutual survival and prosperity may ultimately depend" (11, p.297). Arguments used against subjective indicators fall into four broad categories: validity, interpretation, completeness, and utility. Validity determines the accuracy of the measures of how people evaluate their lives. It may not be possible to obtain repeatable measures. The second concern is that some people will not respond, even if they can. The next concern is that people will give biased answers. Andrews discusses the bias of social desirability, which may produce a bias. The bias of social

last concern about validity involves perceptions of the QOL which may vary rapidly in time and are too unstable to be dependable indications. Andrews suggests that all of these concepts are wrong (11).

Andrews is also concerned about the interpretation of subjective indicators. He says that some people believe that one cannot comprehend what a respondent means by a given answer because each person will be influenced by different factors (11). Several authors also believe that different cultural groups cannot be compared because each group has its own criteria for evaluation (11, 48). Andrews does not agree with these ideas, and indicates that one cannot compare the same group at different times because criteria for evaluation may change over time (11).

The third concern of Andrews is for the completeness of subjective indicators. He has developed one hundred interview items to assess peoples' affective evaluation of their lives. The range of these concerns is very wide and was derived from a list of over eight hundred open-ended questions. These open-ended questions were obtained from previously structured surveys and obtained from a series of interviews. Andrews found that a dozen items, pulled together and appropriately combined, can explain 50-60% of the variation in an instrument of perceived overall QOL (11).

Andrew's last concern is the use of subjective indicators. The first category, about how satisfied or

dissatisfied people are, is irrelevant, since people may be ignorant about the true impact of various life conditions. The second concern about how satisfied or dissatisfied people are, is not useful because the relationship between individual satisfaction and societal welfare is unknown. The third concern is that collecting subjective indicators requires great expense and is not worth the trouble with the availability of cheaper alternatives (11).

Up until now, there have been no analytical studies to support the criteria by which QOL can be measured over fairly long periods of time. It is Andrews' contention that subjective indicators can be developed to focus on long-term aspects of life: i.e., family, housing, community, government, self-accomplishment, independence, and freedom. Andrews indicated that even though specific details and techniques might change, subjective indicators which are based on general overall phenomena would continue to be a relevant part of assessments of well-being (11).

Subjective indicators present a check on the appropriateness of the range of a set of objective indicators. Without results from subjective indicators, it is very difficult to determine which objective indicators, from an endless spread of possible objective indicators are measurable (11). When subjective indicators are used, the question is raised as to whether researchers should accept an individual's perceived QOL, or whether to establish criteria, including

psychological data. When comparing subjective measures to social indicators, subjective measures have, overall, yielded more consistent findings. It appears that positive states (well-being, happiness, satisfaction) remain fairly stable over time and correlate moderately well with each other. Using only subjective indicators meets with familiar criticism, as it does not make sense to say that people in horrible circumstances who say they have a good QOL actually do have a good QOL (18).

The use of visual analogue scales has increased in popularity as QOL scales have become more popular. The visual analogue scales are very sensitive, subjective, and usually quick to complete. However, with the elderly this may be time-consuming since physical weakness may hinder the process of completing the questionnaire. Also, with the elderly, the use of fixed end-points may cause a "ceiling" effect (16).

In looking at the QOL literature, one finds large variations in approaches that clinicians have used. Two different approaches have been used to estimate the QOL. The first is a global evaluation (generic or overall) which addresses many aspects of the QOL. This type of measurement gives some sense of overall well being and tends to be time-consuming and demanding of participants. The other is a more specific evaluation of disease or symptoms of distress caused by treatment. This type of measurement may fail to assess effectively the impact of disease and/or treatment on the

patient's whole life (16). Straight calculation of life-years devalues the lives of the elderly because they have less "capacity to benefit" than the young. "Capacity to benefit" is defined as the ability of an intervention to provide more life-years of adjusted quality (15).

According to Bergner, QOL assessments include information about non-medical and non-physiological outcomes. There are four overall problems which arise from looking at clinical research which assesses the QOL. The four problems include: conceptualization of the factors used, the need for and value of "gold standards", the clinical significance and sensitivity of assessments, and practical problems of administration. With regard to the first problem, assessments should examine those factors which are likely to be affected by the intervention, have troubled patients in the past, or may be affected or are very unlikely to occur but are possible. With regard to the second problem, there are no "gold standards" at the present, and it is very unlikely there will ever be. It may be undesirable to have a "gold standard". As to the third problem, scores resulting among the QOL assessments are not standardized. Currently, the meaning of scores on QOL assessments do not produce mental pictures that represent real people. The last problem is an administrative problem, in that cognitively or emotionally impaired persons cannot respond for themselves. QOL studies may not be appropriate for certain sub-populations, including those who are illiterate or not

proficient in the English language, or who are not familiar with the English culture (51).

Sackett and his peers stated that most health status indices are concerned with two ideas. The first idea is relative to negative end points (mortality). The second idea is concerned with the intermediate process which demands formal entry into the health care system for assessment. As a result, these routine indices may be insensitive to changes in social, emotional, and physical well-being. Sackett and his colleagues developed a health index questionnaire which was designed to measure social, emotional, and physical functions in free-living populations (78).

According to Kirshner and Guyatt, measures of health status can be divided into three categories: discriminative, predictive and evaluative indexes. The evaluative index measures the magnitude of longitudinal change in an individual or group on a specific interest. The development of evaluative indexes provides the main focus for those interested in measuring the QOL. Many investigators have designed these indexes for the general population, but recently the need for disease-specific QOL indexes for use in clinical trials has surfaced. This need has led to the development of disease specific QOL indexes for studies with cancer patients and in the field of rheumatology (26). The elderly, with such a large percentage having chronic disease, might benefit from the use of disease specific QOL scales. It

is also reasonable to assume a nutritional QOL index would be useful to professionals in the health field.

According to Ferrans and Powers, scores on their scale Quality of Life Index were adjusted to give more weight to the most important areas. The final scores reflected the satisfaction of the individuals in relation to what they value as contributing to the QOL. In addition, it should show how much an individual values each aspect in the index. The rationale behind adjustment of the QOL score was based on the assumption that those persons who are highly satisfied with the important areas of their life enjoy a better QOL than those who are very dissatisfied with the important areas of their life (12).

In reviewing the literature, Fowlie and Berkley indicated that QOL scales, or whatever their titles, present the classical dilemma of scale assessment. Since no absolute standard exists, the evaluation of scale performance is always a matter of comparing one scale with another (79).

In order to measure the QOL, researchers have used two varieties of tools. One is a tool that measures many separate dimensions. The other has several different dimensions combined to measure the QOL but gives no overall evaluation. Currently there is no agreement as to which of the infinite number of aspects should be used to measure the QOL (12).

There has been a great deal of work done on the usefulness of QOL scales in determining intervention outcomes.

Scales are available which allow researchers to look at the entire spectrum of outcome measures which are included in the QOL scales. The complexity of factors which are used in nutrition intervention programs has been long recognized. According to Dr. Howard Jacobson, "we need to emphasize the complexity of intervention outcomes and call attention to the fact that the days of addressing nutrition as an isolated variable, by itself, are over" (9, p.24).

According to Vetter et al, "The value of health and social services for elderly people can be measured by their effects on the quality of life of the elderly" (72, p.10). A study was conducted in Wales on 1066 randomly selected elderly individuals to determine their levels of satisfaction with various aspects of their lives. Two years later, the study was repeated to detect any changes in their levels of satisfaction. Vetter and co-workers found that it was meaningless to describe QOL in only one dimension of life. The index of satisfaction was not statistically significant with age, sex, or occupation. Disability had a great effect upon health and leisure activities but had little or no effect on satisfaction with family contacts. Those receiving supplementary benefits (poor people) were affected in all areas except family life, which showed the importance of finances to the QOL (72).

Anderson and his colleagues have recommended that the QOL scale be administered by an interviewer rather than being

self-administered in order to provide sufficient reliability and validity (80). This advice was followed in the administration of the modified INQLS.

Analogue scales have several advantages over the conventional scales. Analogue scales are easy for the subject to grasp, quick to fill out and score, and do not require much subject motivation. Bond and Lader have indicated that analogue scales are more reliable than self-administered scales because the latter tends to underreport dysfunctions (81).

According to Anderson et al, precise measurements of health-related QOL have become more and more important to the evaluation of health programs, planning, and policy-making. Measuring health-related QOL requires questionnaire responses which are hard to assess for validity. They also mentioned that self-administered questionnaires are often assumed to be more costly and time efficient than interviewer measures. The two types of tests are also often assumed to be equivalent in validity (80).

There are problems when testing the reliability of QOL scales. It is difficult to determine whether the QOL (dependent variable) is influenced by treatment and/or disease-stage (independent variable) or other independent variables such as nutritional status, personality type, and coping strategies, unless randomized control groups are used for comparison (16).

The method and place of administration of a questionnaire may affect the response. It is suggested that symptoms tend to improve on a verbal questionnaire, as the interviewee wants to please the interviewer. Randomized and masked study designs are highly recommended to avoid the bias of subjective variables. It has been suggested that when the QOL is used as a measure of outcome, treatment should be used at least three months. Even when confounding variables are used and evenly distributed across treatment groups, their influence on the QOL should be known. Frequency, severity, and duration of symptoms influence the QOL (82).

The assessment of the QOL as a component of nutritional status takes into consideration many aspects: health, financial, social and psychological status, as well as educational levels. The financial status of individuals may influence their nutritional status because of the quality and quantity of food they purchase. The social and psychological status of individuals may be related to their nutritional status through their educational level, social interaction, and social support. Incorporating all of these components to asses the nutritional QOL formed the basis of this research.

Methodology

Instrument Development

The INQLS was prepared and developed by Jacobson and McKenzie. It was pre-tested on a small population through personal interviews at Henderson Towers in Durham, North Carolina, and Hall Towers in Greensboro, North Carolina. The INQLS concludes with a subjective observation sheet from National Health and Nutritional Examination Survey (NHANES 1) which allows the interviewer an opportunity to evaluate the interview for reliability. The observation sheets were to be completed immediately after the interview while thoughts and impressions were still vivid (10).

The INQLS was modified and pre-tested on eleven elderly free-living individuals (the free-living refers to individuals living in the community). The questions retained in the modified INQLS allowed for the collection of descriptive data. The researcher's committee, Dr. Eleanor Schlenker (83) and Dr. Robert Frery (84) reviewed the questionnaire and made recommendations.

The INQLS survey included features (which have been retained in the modified questionnaire) from the following survey instruments:

a. National Health and Nutrition Examination Survey (NHANES I)-Questions from series A,(Question 1,2), series D,(Question 30-43) and questions from E8(Question 52) and E9(Question 53) (85).

b. The Sickness Impact Profile (SIP). (Question C4, Question 23 and Questions E1-E7) (51).

c. Health Habits and History Questionnaire. National Cancer Institute (Questions from series B and Question C1).

Auditory analogue scales were used in the modified INQLS as recommended by Bond and Lader (81). The variables pointed out by Kirchman and Schulte, with regard to age, sex, race, education, marital status, and living arrangements were taken into consideration in developing the modified INQLS.

A review of the INQLS revealed that the questionnaire was long, some questions were repetitious, and other questions were irrelevant. In an attempt to improve upon and modify the INQLS, the researcher shortened the questionnaire, added several questions (designated ML), deleted repetitious questions, and rearranged the questions within specific scales. The modified INQLS included the following scales: Socio-Economic, Health/Well-being, Nutritional, Mobility, and Emotional. The following modifications have been made. (Questions labeled both alphabetically and numerically came from the original INQLS, while those questions labeled numerically were added in the modified INQLS). See Appendices A and B.

Question A1 was deleted because it was irrelevant.

Question #3 was added to determine the source(s) of possible live-in social support.

Question #4 was added to determine the perceived health status of the social support.

Question A4 was moved to the emotional section of the questionnaire.

Question A5 was covered in another question.

Question A6 was omitted to shorten the questionnaire.

Question #5 was added to determine if social support was available outside the home.

Question #6 was added to determine financial status.

Question B2c was revised to include the last 5 years, not the last 20 years.

Question B3 was deleted because it was irrelevant.

Question B4 was modified for clarity.

Question #13 was added in order to determine more specific quantities of medication taken.

Question B5 was modified to include a wider variety of tobacco products.

Question B6a was modified for clarity.

Question B6b was modified to determine how a client perceives his or her weight.

Question B6c was deleted because it was irrelevant.

Question B7b was deleted because it is a duplication of Question #19.

Question B8 was deleted and combined with Question #16.

Question C1 was modified to determine if a special diet

had been given to a client.

Question C2 was deleted because it was repetitious of Question C1.

Question C5 was modified by deleting part 4 & 5 of the answer because they were repetitious.

Question D3 was deleted because it was similar to D13.

Question D4 was deleted because the participants would not be at the nutrition site or other site at all if they could not get in and out of bed.

Question D7 was deleted because the participants would not be at the nutrition site at all if they could not drink from a cup. (or in a group at the other sites)

Question D9 was deleted because if you could perform D8 you could carry out D9 also.

Question D11 was deleted because there are so many differences in degrees of difficulty in turning on-off faucets of various styles.

Question D18 was deleted because it was assumed you could get in and out of a car if you were able to get ot the nutrition site or to a group at the other sites.

Question D21 was deleted because it was similar to D14.

Question D22 was deleted because it was irrelevant.

Question #18 was added to determine if pain was present.

Questions #22-26 were added to obtain a pattern of basic food intake.

Question #29 was added to determine if meals are skipped.

Question #53 was added to determine why clients go to nutrition sites, or if they would be willing to go.

Research Assumptions and Measures

The following assumptions were made prior to assigning to the various scores. The Socio-Economic scale included living arrangements and social support as well as a question about finances. In assigning points on the Socio-Economic scale it was assumed that individuals living in sheltered housing had some reason (health, financial, living alone, etc.)which caused them to go into sheltered housing. It was assumed that individuals living with other people, or having friends or relatives nearby, have a higher support system (Q2, Q5). It was also assumed that elderly who have healthy individuals living with them could receive better care. In contrast, those individuals who live with an individual in poor health may not receive the best care. If an elderly individual lives with two or more individuals, and at least one of them is in poor health, then the elderly individual may not receive the best care (Q2, Q4). With regard to the question on finances, it was assumed that a person can have an adequate amount of food, better nutrition, and health care if his or her finances are adequate (Q6).

The Health and Well-being scale was designed to include questions on general health, illness or medical conditions,

medication, use of tobacco, perceived weight status, and level of pain. It was assumed that individuals with illnesses, especially long-term ones, are less likely to be in good health (Q8-Q11). It was also assumed that those taking the least amount of medication are healthier (Q13-Q14). An assumption was made that individuals who had been hospitalized overnight were not as healthy as those who had not been hospitalized (Q12). It was assumed that those individuals who smoke are less healthy than those who do not smoke (Q15). It was felt that those who thought their weight was about right and those individuals who thought they had gained or lost to their just right weight were in better health. An assumption was made that those who are more active physically are in better health than those who are quite inactive (Q18). Lastly, it was assumed that those individuals who were in pain were in less good health than those without pain (Q19). It was assumed that those individuals who feel good about their weight are likely to be at a good weight. Therefore, they were given a higher score (Q17).

The Nutritional scale included questions on special diets, food and alcohol intake, and whether or not they skip meals. It was assumed that individuals placed on a special diet are less healthy than those not requiring special diets (Q20). This was further broken down into specific types of diets. It was assumed that individuals eating much less than usual some of the time or most of the time do not have proper

nutrient intake. In contrast, it was assumed that those individuals who eat much less than usual, never, or only once in a while, have a better intake of nutrients than those who eat less than usual, and that individuals who pick or nibble at their food some of the time or a lot of the time do not have an adequate nutrient intake. Those individuals who never pick or nibble, and those who pick or nibble only once in a while, probably have better nutrient intake than the frequent pickers or nibblers (Q23). It was also assumed that those individuals who consume a balanced diet (basic four food groups) are better off nutritionally than those who consume only some, or none, from one or more of the food groups (Q24-Q27). It is assumed that individuals who drink alcohol may use it as a food replacement, and therefore may not get proper nutrition (Q28). Therefore, they were given points for lack of alcohol consumption (Q28). Those individuals who eat three meals per day were assumed to have better nutrient intake than those who do not eat three meals a day (Q29).

The Mobility scale included questions which would determine how mobile and physically functional an individual is in carrying out the ADL. It was assumed that those individuals who had very little or no problem getting around were able to shop and prepare their own food, and that individuals who are able to shop for, select, and prepare food are likely to have more control over their food intake than individuals who cannot, and to be more satisfied, overall.

This could influence their nutritional status, so those who were agile were given a higher score than those who had trouble getting around (Q30-Q43).

The Emotional scale included questions dealing with emotions and mental status. It was assumed that people with good mental status (who are emotionally healthy) should be able to shop for, select, and prepare food (Q48-Q50). As in the above situation, if the elderly can shop for, select, and prepare their own food, they are likely to have more control over their own food intake and to be more satisfied. This could influence their nutritional intake. The score, therefore, is higher for individuals exhibiting mentally and emotionally healthy traits.

Samples and Procedures

Both free-living and sheltered housing individuals were included in the study. Sheltered housing individuals are those who live in aggregate housing and receive services on a regular basis. Sheltered housing may include the very poor who live on public assistance or the very wealthy who live in retirement condominiums/communities.

Letters were written to the Capital Area Agency on Aging in Richmond, the nutrition site managers, and the retirement community managers to explain the purpose of the study and to request their cooperation. This was followed by a phone call to make an appointment. Copies of these letters are found in Appendices C and D.1.

Data was collected by the researcher at five Nutrition Program sites in Richmond, Virginia, which were randomly chosen, using the modified INQLS. Subjects were selected from among elderly individuals (aged 60 and over) who normally receive meals at the feeding sites and were willing to participate in the study. The other subjects in Richmond were selected from retirement communities which were willing to participate in the survey. All volunteers were individuals who had the ability to hear, comprehend, and respond to the questionnaire. All but five of the subjects were interviewed by the investigator in the summer and fall of 1990 and the winter of 1991. The other five completed their own questionnaires. A consent form (Appendix E) was signed by each individual prior to the personal interview.

Telephone calls were made to the managers of the testing sites in the New River Valley to explain the project, and these were followed up with a letter containing a copy of the questionnaire and consent form (Appendix D.2). In the New River Valley, the eighteen subjects interviewed were also Title III participants (free-living and sheltered housing individuals) and volunteers in the community.

After the assumptions about each individual test question were made, a code sheet was developed. This code sheet included scores which were assigned to specific individual questions. Some questions required only frequencies. Appendix F contain detailed information for scoring the modified INQLS.

Appendix G contains detailed information to determine a total score for each individual scale and an overall Nutritional QOL score.

All responses were recorded on opscan sheets to facilitate computer analysis of data. Computer analysis was done at the Learning Resources Center at Virginia Tech, Blacksburg, Virginia, under the direction of Dr. Robert Frary. (84) Computer analysis for each individual section included: frequency distribution, factorial analysis, correlation coefficients, ANOVA, and multiple regression equation. The statistical package for SAS (86) was used and the results of the individual scales were combined to present an overall score. The modified INQLS was designed so that the highest scores on each individual scale and the highest overall score represented the best level. The total score should give an index of the Nutritional QOL for an elderly individual.

Results

Demographic Characteristics

The field testing of the modified INQLS included 94 participants from Richmond and the New River Valley area of Virginia. Of the 94 participants, 24 were males, and 70 were females and 21 were black. The youngest was 60, and the oldest was 102 years old. Originally, the modified INQLS involved five age groups: 60 - 69 years, 70 - 79 years, 80 - 89 years, 90 - 99 years, and 100+ years. Among the seventy females, 53 (76%) were free-living and 17 (24%) lived in sheltered housing. Among the 24 men, 13 (54%) were free-living and 11 (46%) men lived in sheltered housing. See Table I for the housing status of the participants. The oldest three age groups were combined for the purpose of statistical analysis. There were 25 individuals in the 60 - 69 age group (18 women, 7 men), 36 individuals in the 70 - 79 age group (26 women, 10 men), while there were 33 individuals in the oldest age group, 80 and above (26 women, 7 men).

The Socio-Economic Scale was designed to determine the social support and financial status of the participants (Q1 - Q6). See Table I for the number of free-living and sheltered housing individuals 60-69 years old. Of the total 25 people, 11 (44%) lived alone and 14 (56%) lived with others. Of those who lived with others, eight lived with a spouse, and five lived with a child/children, and one lived with five other people. Among the 14 individuals who lived with others, 13

Table I

Selected Demographic
Characteristics of Participants

Age Category Years	Free Living No.	%	Sheltered Housing No.	%	Total No.	%
60 - 69	21	84	4	6	25	100
70 - 79	27	75	9	25	36	100
80 and above	18	54.5	15	45.5	33	100

(93%) said they lived with someone in good health. Twenty-four of the 25 total individuals (96%) said they had friends or relatives nearby who could help them. Again, 24 out of the 25 persons (96%) said they had adequate money to make ends meet each month.

In the 70-79 year old age group, there were 36 members. See Table I for the number of free-living and sheltered housing individuals aged 70-79. Of the total 36 people, 22 (61%) lived alone, and 14 (39%) lived with someone else. Of those 14, seven (50%) lived with a spouse, six (43%) lived with a child/children, and one lived with a non-spouse, non-child. Among the 14 living with others, nine (64%) said they lived with someone who was in good health, and six (43%) said they lived with someone in poor health. A discrepancy is seen because one individual lived with several people, some of whom were in good health, and some in poor health. One hundred percent stated they had friends or relatives nearby who could help them. Thirty-four out of the 36 total individuals (94.5%) said that they had adequate funds to make ends meet each month.

The oldest age group (80+) has a total of 33 people. See Table I for the number of free-living and sheltered housing individuals aged 80-89. Twenty-six out of the 33 total (79%) lived alone, and the other seven (21%) lived with others. Of the seven who lived with others, two (29%) lived with their spouses, and four (57%) lived with their child/children. The

seventh person (14%) lived with a non- spouse, non-child. Six (86%) out of the six who lived with others said that the other(s) were in good health. Thirty individuals (91%) of the total said that they had friends or relatives who could help them. Thirty-two people (97%) said they had adequate funds to make ends meet.

The number of free -living and sheltered housing individuals appears in Table I. Of the 70 women, 45 (64%) lived alone and 25 (36%) lived with others. Among the men, 14 (58%) lived alone, and ten (42%) lived with others. Out of the women who lived with others, nine (36%) lived with their spouses, and 13 (52%) lived with a child/children. The other 12% lived with non-spouse, non-child. Among the men, eight (80%) lived with their spouses and two (20%) lived with a child/children. Twenty-three out of the 25 women who lived with others (92%), said they lived with someone in good health. Five men who lived with others (50%), said they lived with someone in good health. Sixty-seven out of the 70 women and 23 out of 24 men (96%) said they had adequate funds.

The Health and Well-being Scale was designed to determine the health status of individuals (Q8 - Q19). The oldest age group (80 and above) has the largest percent of individuals who perceived their health as excellent, while a larger number of the middle group (age 70-79) perceived their health as very good. In the youngest group (age 60-69), the largest percent perceived their health to be only good, see Table II.

Table II

Perceived Health Status by Age

Health Status	Age Groups 60-69 No.	%	70-79 No.	%	80 and above No.	%
Excellent	5	20	3	8	10	30
Very Good	5	20	14	39	6	18
Good	8	32	10	28	6	18
Fair	4	16	7	19	9	27
Poor	3	12	2	6	2	6

Perceived health is probably relative, i.e., by the time one has reached the age of those in the oldest age group, some health problems are expected. Also, a person who has lived with certain health conditions for a long time, may no longer perceive them as health problems. In a table when men and women were compared, almost two times as many women perceived their health to be excellent or very good while the greatest percentage of men perceived their health to be good, see Table III.

It can be seen in Table IV that the youngest age group reported almost twice the number of serious illnesses as did the oldest age group. Eighty-three percent or more still had their illnesses. This reinforces what was seen in Table II. Among the middle and older age groups, approximately 50% had been hospitalized in the last five years. In all three age groups, 84% or more took some kind of medication. Finn and Martin found that the elderly put a large burden on the health care system (37).

Thirty-two percent of the youngest age group reported using tobacco and twice as many men as women used tobacco. Fifteen percent of the oldest group still smoked. The U.S. National Center for Health Statistics also reported that men (32.6%) smoked more than women (27.86%) (87). Fifteen percent of the oldest age group still smoked. This shows the need for education concerning the use of tobacco. In all three age groups 64% or more had maintained their weight in the last

TABLE III

Perceived Health Status by Sex

Health Status	Female No.	Female %	Male No.	Male %
Excellent	15	21	3	12.5
Very Good	22	31	3	12.5
Good	15	21	9	37.5
Fair	16	23	4	17
Poor	2	3	5	21

Table IV

Medical and Health Conditions Reported

	Age Groups					
	60-69 n=25		70-79 n=36		80 and above n=33	
	No.	%	No.	%	No.	%
Condition						
Had serious illness	18	72	22	61	12	37.5
Still have serious illness	15	83	20	91	12	100
Length of illness						
Less than 1 year	3	20	5	25	2	15
1-5 years	7	47	7	35	3	25
5-10 years	4	27	5	2	1	8
10 or more years	7	47	6	3	7	58
Hospitalized in the last five years	7	29	20	55	14	42
Medication taken	21	84	33	92	28	85
Used tobacco	8	32	3	8	5	15
Lost wgt in past year	4	16	6	17	9	28
Gained in past year	3	12	6	17	1	3
Maintained wt	18	72	23	64	22	69
Felt they were just right	12	48	23	64	22	73
Felt overweight	11	44	12	33	4	12
Felt underweight	1	4	1	3	5	15
Felt very active	10	40	20	56	18	55
Felt moderately active	13	52	14	39	14	42
Felt quite inactive	2	8	2	5	1	3

Table IV Cont'd

Medical and Health Conditions Reported

	Age Groups					
	60-69 n=25		70-79 n=36		80 and above n=33	
	No.	%	No.	%	No.	%
Condition Never in pain	11	44	14	39	22	67
Pain once in a while	7	28	12	33	4	12
Pain some of the time	3	12	5	14	2	6
Pain a lot of the time	4	16	5	14	5	15

year. Approximately 64% in the middle age group and 73% in the oldest age group, felt that their weight was just right. According to the U.S. National Center for Health Statistics, 14.9% of those age 65 -74 were 30% or more above desirable weight. Among those 75 years or older, only 10.3% were 30% or more above the desirable weight (87). In the middle age group and the oldest age group, about 52% reported being very active, while in the youngest group, 25% reported being moderately active. The oldest age group showed the largest percentage of individuals who were never in pain. This seems logical since the oldest age group also reported the least percentage of serious illnesses. Both of these statements reinforce what was seen in Table II.

From Table V it can be seen that men reported 21% less serious illness than women. Approximately 95% of both men and women reported they still had their illnesses. The U.S. National Center for Health Statistics (88), however, reports that men have fewer heart conditions and less hypertension than women. Half as many men as women experienced arthritis problems. Approximately two-thirds as many men as women reported frequent constipation. An equal number of men and women reported asthma and frequent indigestion problems. Men experienced more hearing problems than women. In this current study, approximately equal number of men and women (44% and 43%) were hospitalized in the last 5 years. Finn and Martin (37), Ward (65), and White (57) discuss the extensive use of

TABLE V

Selected Medical And Health Conditions Reported

	Females No.	%	Males No.	%
Condition				
Had been told they had a serious illness	36	52	16	73
Still have serious illness	34	95	15	94
Length of illness				
0-1 year	5	15	5	33
1-5 years	14	41	3	20
5-10 years	5	15	5	33
10 or more years	14	41	6	40
Hospitalized in the last five years	31	44	10	43
Medications taken	59	84	23	96
Uses tobacco	9	13	7	29
Lost wgt in past year	13	19	6	26
Gained weight in past year	8	11.5	2	9
Maintained weight	48	69.5	15	65
Felt they were just right	44	63	15	65
Felt overweight	21	30	6	26
Felt underweight	5	7	2	9
Felt very active	39	56	9	37.5
Felt moderately active	29	41	12	50
Felt quite inactive	2	3	3	12.5

Table V Cont'd

Selected Medical and Health Conditions Reported

	Female		Males	
	No.	%	No.	%
Condition				
Never in pain	38	54	9	38
Pain once in a while	15	21	8	33
Pain some of the time	9	13	1	4
Pain a lot of the time	8	11	6	25

health care by the elderly. Eighty-four percent of the women and 96% of the men stated that they took medication of some sort. An equal number of men and women (approximately 65%) had maintained their weight over the last year, and also felt their weight was just right. According to the U.S. National Center for Health Statistics, 12.1% of the men (all ages) were reported as being 30% or more above desirable weight while 13.7% of the women (of all ages) were reported as being 30% or more above desirable weight (87). More women than men reported being very active, while more men than women reported being moderately active. A larger percentage of women than men reported that they were never in pain.

The Nutritional scale was designed to determine the nutritional status of the individuals. In the middle and oldest age groups, 70% and 75% reported they were not eating much less than usual. See Table VI. Approximately 80% of all three age groups never picked or nibbled at their food. The youngest age group and the oldest age group had the highest consumption of alcohol (approximately 28%).

Sixty-six percent of the men and women never ate much less than usual as shown in Table VII. Approximately 80% of the men and women never picked or nibbled at their food. This supports what was shown in Table VI. Alcohol intake was two times greater in women than in men. According to the U.S. National Center for Health Statistics, men (49.3%) drank more than women (29.3%) (87).

TABLE VI

Selected Nutrition Information
Reported by Participants

	Age Groups					
	60-69		70-79		80 and above	
	No.	%	No.	%	No.	%
Information On special diet	8	33	14	40	12	37.5
Type diet-wgt loss	2	25	2	14	2	17
Type diet-wgt gain	1	2	0	0	0	0
Type diet-low sodium	3	37.5	10	71	3	25
Type diet-diabetic	2	25	2	14	5	42
Type diet-low cholesterol	0	0	8	57	2	17
Type diet-medical condition	4	50	5	36	2	17
Type diet-combination	4	50	13	93	2	17
Food Intake Never ate much less than usual	12	48	27	75	23	70
Never ate much once in a while	5	20	1	3	2	6
Never ate much some of the time	1	4	2	6	4	12
Never ate much a lot of the time	7	28	6	17	4	12
Never picked or nibbled	21	84	29	81	27	82
Picked or nibbled once in a while	2	8	0	0	2	6
Picked or nibbled some of the time	0	0	5	14	0	0
Picked or nibbled a lot of the time	2	8	1	3	4	12
Alcohol Intake	7	29	3	9	9	27

TABLE VII

Selected Nutrition Information Reported by Participants

	Females No.	%	Males No.	%
Information On special diets	24	36	9	37.5
Type diet-wt loss	3	12.5	3	33
Type diet-wt gain	1	4	0	0
Type diet-low sodium	13	54	3	33
Type diet-diabetic	6	25	3	33
Type diet-low cholesterol	8	33	2	22
Type diet-other conditions	7	29	4	44
Type diet-combination	7	29	6	66
Food Intake Never ate much less than usual	46	66	16	66
Ate much less than usual once in a while	6	8	2	8
Ate much less than usual some of the time	6	8	1	4
Ate much less than usual a lot of the time	12	17	5	21
Never picked or nibbled	57	81	20	83
Picked or nibbled once in a while	3	4	1	4
Picked or nibbled some of the time	4	6	1	4
Picked or nibbled a lot of the time	5	7	2	8
Alcohol intake	16	23	3	13

Among the three age groups (Table VIII) there was not a great deal of difference in the percentage of individuals who met the recommendations for the basic four food groups (fruits and vegetables, bread and cereals, and meat and meat substitutes) except in the case of the milk group. In the milk group, 8% of the youngest age group drank no milk, while approximately 20% in the middle and older age group drank no milk. In the youngest and middle age group, 91% and 92% ate all three meals. The oldest age group had slightly fewer (88%) eating three meals. The researcher believes this was due to an attitude of not wanting to be bothered (with cooking). Tomiaolo (39) and Roe (43) discussed some physical conditions such as: loss of taste and smell, dental problems, poor digestion, or physical weakness which could cause the elderly to modify their food intake.

In looking at the food consumption pattern in Table IX, men scored higher in meeting the basic four food groups for milk, fruits and vegetables, and bread and cereals. In the case of milk, 58% of the men met the basic four recommendations while only 31% of the women did. With regard to fruits and vegetables, 75% of the men met the basic four recommendations while only 50% of the women did. Sixty-seven percent of the men met the recommendations for the bread and cereal group, while only 36% of the women did. In the meat group, men and women were almost equally likely to meet the recommendations of the basic four food groups (62.5% and 64%,

TABLE VIII

Food Consumption Patterns
Reported by Participants

Basic Food Groups	Age Groups 60-69 No.	%	70-79 No.	%	80 and above No.	%
Drank 2 c. milk or ate dairy products	12	48	14	40	9	28
Drank some milk or ate some dairy products	11	44	14	40	17	53
Drank no milk and ate no dairy products	2	8	7	20	6	19
Ate four servings fruit/veg each day	13	52	22	61	17	55
Ate some fruit/veg each day	12	48	14	39	14	45
Ate four servings bread or cereal each day	11	48	16	45	13	41
Ate some bread or cereal each day	12	52	20	56	19	59
Ate two servings meat meat substitute each day	16	66	20	57	21	68
Ate some meat or meat substitute each day	8	33	15	43	10	32
Food Intake						
Ate all 3 meals per day	23	92	32	91	29	88
Skipped a meal every now and then	2	8	3	9	3	9
Skipped two meals per week	0	0	0	0	1	3

TABLE IX

Food Consumption
Patterns Reported by Participants

Basic Food Groups	Females No.	%	Males No.	%
Drank 2 c.milk or ate dairy products	22	32	14	58
Drank some milk or ate some dairy products	35	51	7	29
Drank no milk or no dairy products	12	18	3	13
Ate four servings fruit/veg each day	34	50	18	75
Ate some fruit/veg each day	34	50	6	25
Ate four servings bread or cereal each day	24	36	16	67
Ate some bread or cereal each day	43	64	8	33
Ate two servings meat or meat substitute each day	42	64	15	62.5
Ate some meat or meat substitute each day	24	36	9	37.5
Food Intake				
Ate all 3 meals per day	66	96	18	75
Skipped a meal every now and then	2	3	6	25
Skipped 2 meals per week	1	1	0	0

respectively). The milk and dairy group is the only food group in which some individuals (both male and female) consumed none. In comparing the sexes, it was found that 96% of the women ate all three meals, while only 75% of the men ate all three meals each day. This may be due to the fact that many men do not like to cook or do not know how to cook. Kershner reported that many older men do not like to cook (62). They also may not be able to afford to eat out, especially if they are on fixed incomes. Kershner (62) and McCauley and Nelson (51) feel that the financial situation should be determined since fixed income may result in an inadequate diet.

The Mobility scale (Q46-Q59) was designed to determine the activity level and mobility of the participants. Among the youngest age group, very few (5-10%) had trouble with mobility, see Table X. This scale included getting your own meals, dressing yourself, walking two or three blocks, walking up and down two steps, getting on and off the toilet, getting in and out of the bathtub, running errands, and doing light chores.

The middle age group had very few problems dressing themselves and getting on and off the toilet (see Table XI). Fifteen to 25% had much difficulty in shampooing their hair, preparing food, walking two to three blocks, walking up and down two steps, getting in and out of the bathtub, and running errands.

TABLE X

Level of Activity and Mobility of Individuals
Age 60-69

Activity	Degree Of Difficulty: Very little/no Difficulty No.	%	Some Difficulty No.	%	Much Difficulty No.	%
Dressing self	24	96	1	4	0	0
Shampooing hair	22	88	2	8	1	4
Preparing food	22	92	0	0	2	8
Cutting meat	24	96	1	4	0	0
Walking 2-3 blocks	21	84	2	8	2	8
Walking up and down two steps	22	88	1	4	2	8
Getting in and out of bathtub	22	92	0	0	2	8
Getting on and off toilet	25	100	0	0	0	0
Reaching and getting down a 5# object	23	96	1	4	0	0
Picking up clothes from floor	23	92	1	4	1	4
Opening jars (previously opened)	24	96	0	0	1	4
Using pen or pencil	23	92	0	0	2	8
Running errand and shopping	23	92	0	0	2	8
Doing light chores	22	88	0	0	3	12

TABLE XI

Level of Activity and Mobility of Individuals
Age 70-79

Activity	Degree Of Difficulty: Very little/no Difficulty No.	%	Some Difficulty No.	%	Much Difficulty No.	%
Dressing self	32	91	0	0	3	9
Shampooing hair	28	80	1	3	6	17
Preparing food	30	83	1	3	5	14
Cutting meat	30	83	1	3	5	14
Walking 2-3 blocks	24	67	3	8	9	25
Walking up and down two steps	26	72	5	14	5	14
Getting in and out of bathtub	23	74	3	10	5	16
Getting on and off toilet	33	92	2	5	1	3
Reaching and getting down a 5# object	29	80.5	2	5.5	5	14
Picking up clothes from floor	30	83	5	14	1	3
Opening jars (previously opened)	31	89	0	0	4	11
Using pen or pencil	32	89	1	3	3	8
Running errand and shopping	25	69	2	6	9	25
Doing light chores	28	78	4	11	4	11

The oldest age group definitely has mobility problems, see Table XII. Most still had few problems getting on and off the toilet, but 15% to 25% had much difficulty in shampooing their hair, preparing food, walking two to three blocks, and walking up and down two steps. Dressing self has now been added to this category. Thirty percent of this age group have much difficulty getting in and out of the bathtub and doing light chores. As high as 40% of this group has much difficulty running errands. There may be several explanations for this. Poor eyesight, chronic diseases, physical weakness, and slower reflexes may keep the older people from driving a car or running errands. Chronic disease and physical weakness are discussed in the Review of Literature in the article by Tomaiolo (39). An additional factor to consider is that many women outlive their husbands, and some of the women in the oldest age group may never have learned to drive.

It can be seen that 80% to 90% of the women had very little or no difficulty with most of the mobility tasks, see Table XIII. About 75% of the women had little or no difficulty in shampooing their hair, and walking up and down two steps, while 65% had little or no difficulty walking two or three blocks or running errands.

Eighty to 90% of the men have very little or no difficulty with most of the mobility tasks (see Table XIV). About 75% of the men have little or no difficulty walking two to three blocks, walking up and down two steps, and running

TABLE XII

Level of Activity and Mobility of Individuals
Age 80 and above

Activity	Degree Of Difficulty					
	Very little/no Difficulty		Some Difficulty		Much Difficulty	
	No.	%	No.	%	No.	%
Dressing self	26	79	2	6	5	15
Shampooing hair	22	67	4	12	7	21
Preparing food	25	76	2	6	6	18
Cutting meat	28	85	3	9	2	6
Walking 2-3 blocks	19	58	8	24	6	18
Walking up and down two steps	22	67	10	30	1	3
Getting in and out of bathtub	17	63	2	7	8	30
Getting on and off toilet	29	88	3	9	1	3
Reaching and getting down a 5# object	27	82	0	0	6	18
Picking up clothes from floor	27	82	3	9	3	9
Opening jars (previously opened)	29	88	1	3	3	9
Using pen or pencil	25	76	6	18	2	6
Running errand and shopping	16	48	4	12	13	40
Doing light chores	20	65	1	3	10	32

TABLE XIII

Level of Activity and Mobility of Females

Activity	Degree Of Difficulty: Very little/no Difficulty No.	%	Some Difficulty No.	%	Much Difficulty No.	%
Dressing self	60	87	2	3	7	10
Shampooing hair	52	75	6	9	11	16
Preparing food	58	84	2	3	9	13
Cutting meat	61	87	3	4	6	9
Walking 2-3 blocks	47	67	10	14	13	19
Walking up and down two steps	52	74	12	17	6	9
Getting in and out of bathtub	49	80	4	7	8	13
Getting on and off toilet	64	91	4	6	2	3
Reaching and getting down a 5# object	58	83	2	3	10	14
Picking up clothes from floor	61	87	7	10	2	3
Opening jars (previously opened)	62	90	4	6	3	4
Using pen or pencil	61	87	5	7	4	6
Running errand and shopping	46	65	4	6	20	29
Doing light chores	54	79	2	3	12	18

TABLE XIV

Level of Activity and Mobility of Males

Activity	Degree Of Difficulty: Very little/no Difficulty No.	%	Some Difficulty No.	%	Much Difficulty No.	%
Dressing self	22	92	1	4	1	4
Shampooing hair	20	83	1	4	3	13
Preparing food	19	79	1	4	4	17
Cutting meat	21	88	2	8	1	4
Walking 2-3 blocks	17	71	3	13	4	16
Walking up and down two steps	18	75	4	17	2	8
Getting in and out of bathtub	13	62	1	5	7	33
Getting on and off toilet	23	96	1	4	0	0
Reaching and getting down a 5# object	21	91	1	4	1	4
Picking up clothes from floor	19	79	2	8	3	13
Opening jars (previously opened)	22	92	2	8	0	0
Using pen or pencil	19	79	2	8	3	13
Running errand and shopping	18	75	2	8	4	17
Doing light chores	16	66	3	13	5	21

errands, while 65% have little or no difficulty getting in and out of the bathtub and doing light chores.

The Emotional Scale (Q60-Q68) was designed to determine emotional status and mental alertness. Table XV, XVI, and XVII are discussed together. In the youngest age group, 84% of the individuals reported they never felt useless, while approximately three quarters of the middle and oldest age groups reported they never felt useless. An interesting pattern is seen when looking at the area of nervousness, restlessness, and irritability. In the youngest age group, approximately 64% never felt nervous. Then in the middle age group, there was about a 20% drop, while in the oldest age group there was a 20% increase. Again, in the youngest age group, 64% reported they never felt restless, the middle group shows about a 30% drop, and the oldest age group shows a 30% increase. A similar situation is seen with regard to never being irritable with 66% of the youngest age group never reporting being irritable, then approximately a 20% decrease in the middle age group, and about a 30% increase in the oldest age group. This interesting pattern may be explained by the fact the youngest and the oldest age groups tend to be the years of stability, while the years of the middle age group of the elderly (70-79) tend to be the years of loss. Many kinds of losses may occur, both physical and social loss (i.e., chronic illness, loss of spouse or close friend). Ward discusses these losses, which could account for the increase

TABLE XV

Perception of Mental Alertness and Emotional Stability of Individuals age 60-69

Characteristic	Never		Once in awhile		Some of the time		Alot of the time	
	No.	%	No.	%	No.	%	No.	%
Feels useless	21	84	2	8	2	8	0	0
Act nervous	16	64	2	8	5	20	2	8
Act restless	16	64	3	12	5	20	1	4
Act irritable	19	76	4	6	1	4	1	4
Act confused/ disoriented	23	92	2	8	0	0	0	0
Forgetful	10	40	8	32	6	24	1	4
Trouble focusing attention	22	88	2	8	0	0	1	4
Not enough energy	18	72	2	8	1	4	4	16
Trouble falling asleep	13	52	1	4	8	32	3	12

TABLE XVI

Perception of Mental Alertness and Emotional Stability of Individuals age 70-79

Characteristic	Never		Once in awhile		Some of the time		Alot of the time	
	No.	%	No.	%	No.	%	No.	%
Feels useless	25	73	2	6	6	18	1	3
Act nervous	15	42	8	22	11	31	2	5
Act restless	11	31	10	28	11	31	4	10
Act irritable	20	55	6	17	8	22	2	6
Act confused/ disoriented	27	75	4	11	5	14	0	0
Forgetful	11	30.5	11	30.5	5	14	9	25
Trouble focusing attention	29	81	2	5.5	3	8	2	5.5
Not enough energy	15	42	6	17	13	36	2	5
Trouble falling asleep	16	44	5	14	10	28	5	14

TABLE XVII

Perception of Mental Alertness and Emotional Stability of Individuals 80 and Older Individuals

Characteristic	Never		Once in awhile		Some of the time		Alot of the time	
	No.	%	No.	%	No.	%	No.	%
Feels useless	24	73	2	6	6	18	1	3
Act nervous	20	61	3	9	5	15	5	15
Act restless	19	58	6	18	5	15	3	9
Act irritable	29	88	4	12	0	0	0	0
Act confused/ disoriented	24	73	5	15	1	3	3	9
Forgetful	6	18	10	30	11	33	6	18
Trouble focusing attention	28	85	4	12	1	3	0	0
Not enough energy	13	39.5	3	9	13	39.5	4	12
Trouble falling asleep	19	58	5	15	6	18	3	9

in nervousness, irritability and restlessness in the middle age group (65). In another area, 92% of the youngest age group said they never felt confused or disoriented. Among the middle and oldest age groups, approximately three quarters of these individuals said they never felt confused or disoriented. As for being forgetful, almost twice the percent in the youngest age group stated they were never forgetful, as compared to the oldest age group. In all three age groups, approximately 80-85% reported never having trouble focusing their attention. The youngest age group reported almost twice the percentage as never having enough energy, when they were compared to the middle and oldest age group. Lastly, answers in all of the elderly age groups showed that 50% had trouble going to sleep.

Tables XVIII and XIX are discussed together. Approximately equal number percentages of men and women reported they never felt useless, nervous, confused or disoriented, forgetful, or lacking in energy, and never had trouble getting to sleep. Women showed higher percentages than men in reporting they were never restless, never irritable, or never had trouble focusing their attention. The equal percentages of men and women regarding never having trouble getting to sleep, and very similar to the percentages in all age groups, see Tables XV, XVI, XVII.

The Mobility Scale was designed to determine the activity level and mobility of the participants. The activity level

TABLE XVIII

Perception of Mental Alertness and Emotional Stability Among Females

Characteristic	Never		Once in awhile		Some of the time		Alot of the time	
	No.	%	No.	%	No.	%	No.	%
Feels useless	53	78	4	6	9	13	2	3
Act nervous	37	53	9	13	18	26	6	8
Act restless	37	53	8	11	20	29	5	7
Act irritable	53	76	9	13	7	10	1	1
Act confused/ disoriented	57	81	7	10	4	6	2	3
Forgetful	22	31	18	26	17	24	13	19
Trouble focusing attention	62	89	4	6	2	2.5	2	2.5
Not enough energy	36	51	6	9	22	31	6	9
Trouble falling asleep	34	49	8	11	20	29	8	11

TABLE XIX

Perception of Mental Alertness and Emotional Stability Among Males

Characteristic	Never		Once in awhile		Some of the time		Alot of the time	
	No.	%	No.	%	No.	%	No.	%
Feels useless	17	71	2	8	5	21	0	0
Act nervous	14	58	4	17	3	12.5	3	12.5
Act restless	9	37.5	11	46	1	4	3	12.5
Act irritable	15	63	5	21	2	8	2	8
Act confused/ disoriented	17	71	4	17	2	8	2	8
Forgetful	5	21	11	46	5	21	3	12
Trouble focusing attention	17	71	4	17	2	8	1	4
Not enough energy	10	41	5	21	5	21	4	17
Trouble falling asleep	14	58	3	12.5	4	17	3	12.5

and mobility of individuals according to age group is seen in Tables X-XII. The activity level and mobility among females can be seen in Table XIII while the activity level and mobility among male participants can be seen in Table XIV.

The Emotional Scale was designed to determine emotional status and mental alertness. The perception of mental alertness and emotional stability among individuals according to age groups can be seen in Tables XV-XVII. Similarly, the mental alertness and emotional stability of individuals by sex can be seen in Tables XVIII and XIX.

After the interview, the interviewer completed an observation sheet. From these, it was felt that 94% or more of the respondents provided satisfactory information. Eighty-eight percent or more of the two youngest age groups seemed to be very alert. Sixty-four percent of the oldest age group seemed to be very alert, with 24% of this group being less alert but still able to respond to the questions. In ninety-four percent or more of the cases, the questionnaire held the participants' attention throughout the interview. Ninety-three percent or more of the participants did not appear to be upset or depressed by the questionnaire. The same percentage did not seem to be bored or disinterested during the questionnaire.

Statistical Analysis

Plan of Analysis

Statistical analysis of the data from the modified INQLS included means, frequencies, correlational analysis (Pearson's correlation coefficient), multiple regression (maximum R-square) and analysis of variance (ANOVA - General Linear Model Procedure) (see Tables XX-XXIII). The null hypothesis was assumed as follows: the Socio-Economic Status score, the Health and Well-Being score, the Nutritional score, the Mobility score, the Emotional score, age, sex, are not related. For the purpose of this study, an alpha level of .05 was accepted as the level of significance.

Correlational analysis was done to determine whether a relationship existed between the various scores, age, sex, and the nutritional score, and also, to provide an estimate of how closely the variables are related (strength of relationship). The multiple regression equation was used to determine which variables gave the best prediction of the nutritional QOL (89). The analysis of variance was used to compare the means of six groups (60-69 year old women, 60-69 year old men, 70-79 year old women, 70-79 year old men, 80 and above year old women and 80 and above year old men).

Findings and Discussion

Mean scores and standard deviation for SES, HWB, NUT, MOB, and EMOT are given in Table XX. Statistically significant relationships were seen in four scores. The

Table XX

Means of SES, HWB, NUT, MOB, EMOT Scales

Variable	N	Mean	Standard Deviation
SES	94	7.7447	1.1817
HWB	94	9.2340	2.3993
NUT	94	18.3085	2.5779
MOB	94	37.1915	5.5673
EMOT	94	29.3936	4.9519

*P=.05 Level of accepted significance
SES = Socio-Economic scale
HWB = Health Well-Being scale
NUT = Nutritional scale
MOB = Mobility scale
EMO = Emotional scale

Mobility score was significantly related to the Socio-Economic Status score, the Emotional score and age. Also, the Emotional score was related to the Health and Well-being score. There were no statistically significant relationships between the independent variables and nutrition, see Table XXI.

The significant relationship between the Socio-Economic status and the Mobility scores may be because people who are mobile are likely to be able to be more sociable. Schrier stated that many researchers use the definition of QOL as: normal physical and social functioning (17). Hornquist also defines the QOL as the degree of needs satisfaction met (23). Needs satisfaction includes both physical and social needs. According to Wiklund, social roles and physical functioning are essential components of the QOL (48).

The significant relationship between the Mobility score and the Emotional score may indicate that a person who is more mobile is less frustrated, less nervous and restless and has a better outlook on life. Wiklund again believes that mental health and physical functioning are essential components of the QOL (48). Goodinson and Singleton mention fulfillment of basic aspects of ADL, sense of purpose, self-esteem, integrity, achievement of one's work or family life as factors which are necessary to function as independent and autonomous individuals (16).

The significant relationship between Mobility score and

TABLE XXI

Pearson Correlation Coefficients of
SES, HWB, NUT, MOB, EMO Scales and Age,
with the Nutritional Scale, n=94

	SES	HWB	NUT	MOB	EMOT	AGE
SE	1.00000					
	0.0					
HWB	-.05834	1.00000				
	.5765	0.0				
NUT	-.15035	-.09735	1.00000			
	.1481	.3481	0.0	.3336		
MOB	.30007	-.11649	-.05061	1.00000		
	*.0033	.2635	.6281	0.0		
EMOT	.15885	-.25220	-.06774	.49804	1.00000	
	.1262	*.0142	.5165	*.0001	0.0	
AGE	-.15472	.10818	-.16669	-.35726	-.13524	1.00000
	.1365	.2993	.1083	*.0004	.1937	0.0

*P=.05 Level of accepted significance
SES = Socio-Economic Status scale
HWB = Health Well-being scale
NUT = Nutritional scale
MOB = Mobility scale
EMO = Emotional scale

age indicate that as a person ages their mobility decreases, for whatever reason. Osteoarthritis and osteoporosis are two types of health problems in the elderly which limits their mobility (45). The presence of chronic conditions greatly increases with age. Many of these conditions such as arthritis and rheumatism, heart conditions, visual impairments, and impairments of lower extremities and hips may cause decreased mobility, according to Ward (65).

The significant relationship between the Health and Well-being score and the Emotional score indicate that a healthier person usually has a better outlook on life. Hinds mentions researchers and clinicians being interested in QOL of individuals who are coping with stress which is related to chronic illness of life-threatening illnesses (35). White et al report that disability and dependency have a great impact on nutrition, especially on those over 80 (57). An elderly person who is non-ambulatory and cannot drive is totally dependent on others for their food source. This may put them at a nutritional risk. No statistical significance was found in the use of a one-way ANOVA with the NUT, SES, HWB, MOB, EMO scores and age, but using the one-way ANOVA for NUTS, SES, HWB, MOB, and EMO scores with sex, a significant relationship was found between sex and SES score (F value = 21.87, n = 93). Using the two-way ANOVA (age-sex) with the NUT, SES, HWB, EMO, and MOB scores no significant relationships were identified. The difference can be explained by the fact that the

significant relationship with age was not strong enough to be maintained when sex was added to the analysis. See Table XXII.

In the multiple regression analysis no statistical relationship existed between the dependent variable, nutrition, and any of the independent variables, SES, MOB, HWB, EMO, and age, see Table XXIII. Since the best possible regression model only predicted 7.7% of the variance, this leaves 92.3% of the variance due to unidentified predictors.

In all three analyses, none of the factors considered, accounted for any statistically significant variance in the Nutritional score. It may be possible that nutritional QOL is affected by additional factors that were not identified using the modified INQLS.

TABLE XXII

Two-way Analysis of Variance:
NUT, SES, HWB, MOB, EMOT by Age-Sex

Variable		X	SD	N	F-value
NUT	F-1	18.22	2.56	18	.23
	M-1	20.42	2.37	7	
	F-2	18.42	2.87	26	
	M-2	18.30	2.58	10	
	F-3	17.84	2.41	26	
	M-3	17.71	1.89	7	
SE	F-1	8.56	.62	18	1.57
	M-1	7.14	2.04	7	
	F-2	8.04	.66	26	
	M-2	6.50	1.65	10	
	F-3	7.69	.74	26	
	M-3	7.14	1.57	7	
HWB	F-1	8.72	2.47	18	.19
	M-1	9.93	2.98	7	
	F-2	9.02	2.19	26	
	M-2	9.40	2.67	10	
	F-3	9.38	2.43	26	
	M-3	9.85	2.34	7	
MOB	F-1	40.39	2.57	18	.45
	M-1	38.57	4.32	7	
	F-2	37.04	6.14	26	

TABLE XXII Cont'd

Two-way Analysis of Variance:
NUT, SES, HWB, MOB, EMOT by Age-Sex

Variable		X	SD	N	F-value
	M-2	36.9	5.69	10	
	F-3	35.08	5.80	26	
	M-3	36.43	6.68	7	
EMO	F-1	32.00	4.07	18	1.19
	M-1	29.00	6.14	7	
	F-2	27.65	5.18	26	
	M-2	29.00	4.99	10	
	F-3	29.65	4.52	26	
	M-3	29.14	5.15	7	

Prob > F = .05

F-1 = 60-69 year old female

M-1 = 60-69 year old male

F-2 = 70-79 year old female

M-2 = 70-79 year old male

F-3 = 80-89 year old female

M-3 = 80-89 year old female

TABLE XXIII

Multiple Regression Table for Nutrition

Independent Variable	Model R	Beta	Prob > F
AGE	.028	-.55	.07
SES	.059	-.39	.23
HWB	.067	-.12	.30
EMO	.075	-.37	.57
MOB	.077	-.03	.66

Prob > F = .05

SES = Socio-Economic Status scale

HWB = Health Well-being

EMO = Emotional scale

MOB = Mobility scale

SUMMARY AND CONCLUSIONS

The Institute of Nutrition Quality of Life Scale for the Elderly (INQLS) was studied and then modified by the researcher. In this paper, the new version was referred to as the modified INQLS. It was pretested in the Petersburg, Virginia area among participants in the Crater Area Agency on Aging. Field testing of the final modified INQLS was done in Richmond, Virginia and the New River Valley area of Virginia. Among sheltered and free-living individuals there were 94 total respondents (70 women, 24 men) between the ages of 65 and 102.

Statistical analysis of the scores from the modified INQLS included frequencies, correlational analysis, multiple regressions and ANOVA. Four significant relationships were found in the correlational analysis. The Mobility score was related to the Socio-Economic status score ($r = .0007$, Prob > $r = .0003$), Emotional score ($r = .49804$, Prob > $r = .0001$) and age ($r = .35726$, Prob > $r = .0004$). The HWB score was significantly correlated with the Emotional score ($r = .25220$, Prob > $r = .0142$). In the one-way ANOVA (sex) a significant relationship was found between sex and the Socio-Economic scale score. No significant relationships were found in the one-way ANOVA (sex) and the two-way ANOVA (age-sex). No statistical significance was found between the Nutritional scale score and the independent variables of the Socio-Economic score, Health and Well-Being scale score, Mobility

scale score, Emotional scale score, and age.

The present study shows the need for further modification and development of the modified INQLS. See Appendix H for specific recommendations. In addition, the following areas may need to be considered:

1. Identifying factors which will better predict the nutritional QOL.
2. Additional field testing on a larger population.
3. Additional field testing on the oldest segment of the population (80+).
4. Additional men in the sample population.
5. Review weighing of selected scores.
6. Develop an index to determine a range of nutritional QOL scores (poor, fair, good, excellent).

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APPENDIX A

THE INSTITUTE OF NUTRITION QUALITY OF LIFE SCALE FOR THE ELDERLY

This form ask a variety of questions about your background, health, nutrition, activities, and character traits. The information will help us tailor our services so that they will fit your needs better.

It will take about fifteen minutes to complete all of the questions. Your responses will be kept confidential. Thank you for your time and cooperation.

Name or I.D. Number_____
Male_____ or Female_____
Date_____

First, I would like to verify a few facts.

A1. What is your complete address?
_____(number and street)
_____(city and state)

A2. what type of living quarters do you live in? (check one)

_____ Private residence or apartment building

_____ Shelter housing

_____ Nursing home

_____ Other

A3.How many people live in you household including yourself?

_____

A4.How old are you now?_____years

A5.What is your marital status? (check one)
Single_____ Married_____ Widowed_____
Divorced/Separated_____

A6.What is the highest grade or year of school that you ever completed? Include trade or vocational school.

_____

The questions I am going to ask you now concern your health as well as diseases and operations you might have had.

B1.Would you say that your health in general is:

Excellent_____
Very Good_____
Good _____
Fair _____
Poor _____

B2a.Have you ever been told by a doctor that you had a serious illness? Yes_____ No_____

B2b.When were you first told that you had this condition?

Less than one year ago _____
Between one and five years ago_____
Between five and ten years ago_____
Ten or more years ago _____

B2c.Since 1970, have you ever been hospitalized overnight for problems related to your illness?

Yes_____ No_____

B3.In the past ten years, have you ever been confined to bed for most of the day for a two week period?

Yes_____ No_____

B4. Do you take any medicine prescribed for you?

Yes_____ No_____

B5.Do you smoke cigarettes now? Yes_____ No_____

B6a.How does your weight now compare to your weight 6 months ago? Is it at least 10 pounds more, at least 10 pounds less or about the same?

At least 10 lbs more _____
At least 10 lbs less _____
About the same _____

B6b.About how much do you weigh now?_____lbs.

B6c.What was your usual weight at the age of 25?_____lbs.

B7a.In your usual day, aside from recreation, are you physically:

Very active _____
Moderately active _____
Quite inactive _____

B7b.Do you follow a regular program of physical exercise?

Yes_____ No_____

B8.Do you take multivitamin pills regularly?
Yes_____ No_____

These questions are about nutrition and eating habits.

C1.Are you on a special diet?
No_____
Yes_____Type:Weight Loss_____Low salt_____

For medical condition_____Low cholesterol_____
Vegetarian_____Weight gain_____Other_____

For the next three questions, using the categories listed, please answer if:

	Never	Once in a while	Some of the time	Alot of the time
	...1.....	2.....	3.....	4..

C2.I am eating special or different food, for example, soft food, low-salt low-fat, low-sugar.

C3.I am eating much less than usual.

C4.I just pick or nibble at my food.

C5.On the average, how often do you drink alcoholic beverages, that is beer, wine or liquor?

Never _____
days a week _____
days a month _____
More than 3 but less than 12 times/year _____
No more than 3 times a year _____

Now I am going to read a list of activities with which some people have difficulty. Using the categories listed, please tell me if you can:

Degree of Difficulty

None	Some	Much	Can't
..1.....	2.....	3.....	4...

D1.Dress yourself?

D2.Shampoo your hair?

D3.Stand up from an armless straight chair?

D4.Get into and out of bed?

D5.Prepare your own food?

D6.Cut your meat?

D7.Lift a full cup or glass to your mouth?

D8.Walk two or three blocks?

D9.Walk from one room to another on the same level?

D10.Walk up and down at least two steps?

D11.Turn faucets on and off?

D12.Get in and out of the bathtub?

D13.Get on and off the toilet?

D14.Reach and get down a 5 lb. object (bag of sugar) from just above your head?

D15.Bend down and pick up clothing from the floor?

D16.Open jars which have been previously opened?

D17.Use a pen or pencil to write with?

D18.Get in and out of a car?

D19.Run errands and shop?

D20.Do light chores such as vacuuming?

D21.Lift and carry a full bag of groceries?

D22.Do heavy chores around the house or yard, or washing windows, walls or floors?

Now I am going to read you some traits some people have. Please tell me how well these traits describe you.

Never	Once in a while	Some of the time	Alot of the time
...1.....	.....2.....	.....3.....	.....4..

E1. I say how bad or useless I am, for example, that I am a burden on others.
E2. I act nervous or restless.
E3. I act irritable and impatient with myself, for example, talk badly about myself, blame myself for things that happen.
E4. I often act irritable toward those around me, for example, snap at people, give sharp answers, criticize easily.
E5. I sometimes behave as if I were confused or disoriented in place or time, for example, where I am, who is around, directions, what day it is.
E6. I forget a lot, for example, things that happened recently, where I put things, appointments.
E7. I do not keep my attention on any activity for long.
E8. Sometimes I have things I want to do, but I just feel too weak, too tired and I don't have enough energy to do them.
E9. I have trouble falling asleep.

Thank you very much for you time taken to be interviewed. The responses will help us to better serve you. Your participation is sincerely appreciated.

OBSERVATION SHEET

INTERVIEWER: COMPLETE AT CONCLUSION OF INTERVIEW

DS-1.Do you feel that the information provided by the Subject or Proxy was satisfactory?

Yes.....1 (Q.05-3)

No.....2

DS-2.If not, why not?

_____

_____

_____

DS-3. Please circle the number that best describes the subject's awareness level during the interview.

1	2	3	4	5
Very Alert				Very Confused

OR

SUBJECT NOT OBSERVED BY INTERVIEWER.....0

COMMENTS:_____

_____

_____

DS-4. In regard to the questionnaire do you feel the questionnaire:

	YES	NO
a. held the respondent's attention throughout the interview?		
b. was upsetting or depressing to the respondent?		
c. was boring or uninteresting to the respondent?		

(IF YES TO b OR c):

DS-5. Was there a section that seemed to be particularly upsetting or problematic for the respondent?

If so, note below.

_____

_____

_____

DS-6. Record any relevant observations, comments or impressions you may have had about this interview.

APPENDIX B

THE MODIFIED INSTITUTE OF NUTRITION QUALITY OF LIFE SCALE FOR THE ELDERLY

This questionnaire will take about fifteen minutes to complete. Your responses will be kept confidential. You may omit any question that you prefer not to answer. Thank you for your time and cooperation.

NAME_____ ID #_____
MALE_____ FEMALE_____
DATE_____ DATE OF BIRTH_____
PLACE OF INTERVIEW_____

SOCIO-ECONOMIC

1. (A2) What type of living quarters do you live in? (check one)
What are your living accommodation or arrangements?
1. Private resident or apartment building_____(3 points)
2. Sheltered housing_____(2 points)
3. Trailer_____(1 point)
4. Other_____

2. (A3) How many people live in your household including yourself?_____
Including yourself, how many people live with you?
yourself only_____(1 point) yourself and others(s)_____(2 points)

3. (ML1) Identify the people you live with.
Who do you live with?
1. spouse_____
2. child/children_____
3. grandchild/grandchildren_____
4. brother/sister_____
5. other relatives_____
6. friends_____

4. (ML2) Are they in good health?
1. Yes (1pt) 2. no (2 pts)

5. Do you have friends or relatives nearby who could assist you?
1. Yes (1pt) 2. no (2 pts)

6. (ML3) Do you have adequate funds to make ends meet each month?
1. Yes (2 pts) 2. No (1pt)

7. (ML4) If enough money is not available, do you:
   1. skip two meals per day_____(1 pt)
   2. skip one meal per day_____(2 pts)
   3. skip two meals per week_____(3 pts)
   4. skip a meal every now and then ___(4 pts)

HEALTH - WELL BEING SCALE

The questions I am going to ask you now concern your health as well as disease and operations you might have had.

8. (B1) Would you say that your health in general is:
What is the condition of your health?
1. Excellent_____(5 pts)
2. Very good_____(4 pts)
3. Good_____(3 pts)
4. Fair_____(2 pts)
5. Poor_____(1 pt)

9. (B2a) Have you ever been told by a doctor that you had a serious illness or medical condition?
1. Yes_____(1 pt) 2. No_____(2 pts)
If yes, go to question 9b.
If no, go to question 11.

10. (B2a) Do you still have this condition?

11. (B2b) When were you first told that you had this condition?
1. Less than one year ago_____(1 point)
2. Between one and five years ago_____(2 points)
3. Between five and ten years ago_____(3 points)
4. Ten or more years ago_____(4 points)

12. (B2c) In the last 5 years, have you ever been hospitalized overnight?
1. Yes_____(1 pt) 2. No_____(2 pts)

13. (B4) Do you take any medicine? (prescription & over the counter)
1. Yes_____(1 pt) 2. No_____(2 pts)
3. If yes, what kind?_____

14. How many different kinds of medicine do you take per day?
1. 0-3 (1pts) 2. 3-6 (2pts) 3. 7 & above (3pts)

15. (B5) Do you use tobacco products now?
1. Yes_____(1 pt) 2. No_____(2 pts)
If yes, what kind?
chew_____
dip_____
cigar_____
cigarettes__
pipe_____
snuff_____

16. (B6a) In the last year, have you lost, gained or maintained your weight?
1._____ pounds lost (1pt) 2. gained_____ (1 pt)
maintain_____(2 pts)

17. (B6b) How do you feel about your weight now?
1. just right_____(2 pts)
2. overweight_____(1 pt)
3. underweight_____(1 pt)

18. (B7a) In your usual day, aside from recreation, are you physically:
1. very active_____(3 pts)
2. moderately active____(2 pts)
3. quite inactive_____(1 pt)

19. (ML5) Do you have any pain now?
1. never_____(4 pts)
2. once in a while_____(3 pts)
3. some of the time_____(2 pts)
4. a lot of the time_____(1 pt)

NUTRITIONAL SCALE

These questions are about nutrition and eating habits.

20. (C1) Have you been placed on a special diet by a dietitian or physician?
    1. No_____(2 pts) 2. Yes_____(1 pt)
    3. Don't know_____(0pt)

21. (C1) If so, what type
    TYPE: 1. Weight loss_____ 2. Weight gain_____
    3. Low salt_____ 4. For medical condition_____
    5. Low cholesterol_____6. Vegetarian_____
    7. Weight gain_____

For the next two questions, using the categories listed, please answer if.

Never 1 (4pts) | Once in awhile 2 (3pts) | Some of the time 3 (2 pts) | alot of the time 4 (1 pt)

---

22. (C3) Are you eating much less than usual._____

23. (C4) Do you pick or nibble at your food._____

Questions 24-27
(ML6)How many times per day do you eat or drink the following?
None (0 pts) Eats/drinks some (1 pt) Meets the basic four (2 pts)

24. Milk or Dairy Products_____
25. Fruit,Fruit juice_____ or vegetables_____
26. Bread, cereal or starch_____
27. Meat, dry beans, or peanut butter_____

28. (C5) Do you drink alcoholic beverages, that is, beer, wine, or liquor?
    1.Yes_____(0 pt) 2.No_____(3 pts)

29. **If Yes, see below**
    1. # days a week_____(2 pts)
    2. # days a month____(1 pt)

MOBILITY SCALE

I am going to read a list of activities with which some people have difficulty.

Using the categories listed, please tell me if you can:

Degree of Difficulty

1. Yes (1 pts) 2. Sometimes (2 pts) 3.little/Never (3 pts)

30. (D1) Dress yourself?_____
31. (D2) Shampoo your hair?_____
32. (D5) Prepare your own food?_____
33. (D6) Cut your meat?_____
34. (D8) Walk two or three blocks?_____
35. (D10) Walk up and down at least two steps?_____
36. (D12) Get in and out of the bathtub?_____
37. (D13) Get on and off the toilet?_____
38. (D14) Reach and get down a 5# object (bag of sugar) from just above your head?_____
39. (D15) Bend down and pick up clothing from the floor?_____
40. (D16) Open jars which have been previously opened_____
41. (D17) Use a pen or pencil to write with?_____
42. (D19) Run errands and shop?_____
43. (D20) Do light chores such as vacuuming?_____

EMOTIONAL SCALE

Now I am going to read you some traits all ages of people have. As we go through these traits, please respond with:

1. Never (4 pts) 2. Once in awhile (3 pts)
3. some of the time (2pts) 4. alot of the time (1pt)

---

44. (E1) Do you feel useless, for example, that you are a burden on others._____
45. (E2) Do you act nervous._____
46. (E3) Do you act restless._____
47. (E4) Do you act irritable toward those around you, for example, snap at people, give sharp answers, criticize easily._____
48. (E5) Do you sometimes behave as if you were confused or disoriented in place or time, for example, where you are, who is around, directions, what day it is._____
49. (E6) Do you forget a lot, for example, things that happened recently, where you put things, appointments etc._____
50. (E7) Do you have trouble focusing your attention on one activity for a long period of time._____
51. (E8) Do you have things you want to do, but just feel too weak, too tired and don't have enough energy to do them._____
52. (E9) Do you have trouble falling asleep._____

(A4) How old are you now?_____

(ML7) Why have you chosen to come to the nutrition site?_____.

OR

Would you consider eating at a nutrition site for the elderly?_____

Thank you very much for your time. The responses will help us to better serve you. Your participation is sincerely appreciated.

OBSERVATION SHEET

INTERVIEWER: Complete at Conclusion of Interview

DS-1. Do you feel that the information provided by the **subject** was satisfactory?
YES.....1 (Q.05-3)
NO.....2
DS-.2 If not, why not?

_____
_____
_____

DS-3. Please circle the number that best describes the **subject's** awareness level during the interview.

1	2	3	4	5
Very Alert				Very Confused

OR

COMMENTS:

_____
_____
_____
_____

DS-4. In regard to the questionnaire do you feel the questionnaire:
1. YES 2. NO
a. held the respondent's attention throughout the interview?
b. was upsetting or depressing to the respondent?
c. was boring or uninteresting to the respondent?

(IF YES TO B OR C):
DS-5. Was there a section that seemed to be particularly upsetting or problematic for the respondent?
If so, note below:

_____
_____
_____

DS-6. Record any relevant observations, comments or impressions you may have had about this interview.

_____
_____
_____

APPENDIX C

March 26, 1990

Capital Area on Aging
Address

Dear Ms. Adams:

Presently I am a student at Virginia Tech working on my research, in partial fulfillment of requirements for my master's degree. For my research I plan to field test a questionnaire to determine the nutritional quality of life of the elderly. This will allow for an assessment of symptoms of mild malnutrition.

In order to complete this research, I would like to ask permission to conduct my research at your facility. It is my intention to personally interview participants in the Nutrition Program for the Elderly that are verbally able to answer this questionnaire. For your review, I have enclosed a copy of the questionnaire, which I plan to use and a copy of the permission form which participants will need to sign.

Thank you for your time and consideration. I will be happy to provide you with a copy of my research findings. I will be in touch with you shortly to answer any questions you may have.

Sincerely,

Marty Lawrence, B.S., R.D.
Graduate Student
Human Nutrition and Foods
Virginia Polytechnic Institute & State University

Jane Wentworth, Ph.D., M.P.H.
Assistant Professor
Human Nutrition and Foods
Virginia Polytechnic Institute & State University

APPENDIX D.1

March 26, 1990

Site Manager
Address

Dear Ms./Mr.:

Presently I am a student at Virginia Tech working on my research, in partial fulfillment of requirements for my Master's Degree. For my research, I plan to field test a questionnaire to determine the nutritional quality of life of the elderly. This will allow for an assessment of symptoms of mild malnutrition.

In order to complete this research, I would like to ask permission to conduct my research at your facility. For your review, I have enclosed a copy of the questionnaire which I plan to use and a copy of the permission form which the participants will need to sign. It is my intention to personally interview participates who receive your services and are physically and mentally able to respond to these questions.

Thank you for your time and consideration. I will be happy to provide you with a copy of my research finding. I will be in contact with you shortly to answer any questions you may have and, to determine if I can carry out my research at your agency.

Sincerely,

Marty Lawrence, B.S., R.D.
Graduate Student
Human Nutrition and Foods
Virginia Polytechnic Institute & State University

Jane Wentworth, Ph.D., M.P.H.
Assistant Professor
Human Nutrition and Foods
Virginia Polytechnic Institute & State University

APPENDIX D.2

January 31, 1991

Mrs. Tina King, Supervisor
Nutrition Program for Elderly
New River Valley Senior Program
143 3rd St. NW
Pulaski, Virginia 24301

Dear Mr. King,

It was a pleasure talking with you today, and we appreciate the opportunity to interview some of the participants of the nutrition program in Christiansburg and Blacksburg.

Enclosed you will find a copy of the consent form and the modified nutritional quality of life questionnaire that Mrs. Marty Lawrence has developed (modified). The original one was developed by Jacobson and McKensey, but lacked testing. With the help of HNF faculty and Dr. Bob Frary on campus this questionnaire is an improvement, but will also need to be modified, I am sure. We will be able to better determine changes after interviewing more and with data analysis.

Thank you for continuing to assist our students in meeting some of their needs for field experiences or for subjects for their research.

Sincerely,

Jane Wentworth
Assistant Professor (retired)

Encl: as noted above

APPENDIX E

CONSENT FORM: Field Testing of the Modified Institute of Nutrition Quality of Life Scale for the Elderly.

1. I hereby acknowledge my voluntary participation in the field testing of the modified Institute of Nutrition Quality of Life Scale for the Elderly.

2. No guarantee of benefit has been made to me by anyone to encourage me to participate in this study.

3. I understand that I shall not be identified by name in any of the above cases.

4. Information gathered in this study may be used for educational or research purposes.

5. Information relating to my responses may be presented at scientific meetings and/or published and republished in professional journals or books.

6. VA. Tech. may use this research for any other purpose which they consider appropriate in interest of education, knowledge, or research.

7. I understand, that voluntary participation, allows me not to participate if I do not want to, and I also may withdraw at any time.

8. I understand that this research project has been approved by the Human Subjects Research Committee and the Institutional Review Board, and that if I have any questions concerning the above I should contact the following:

Dr. Jane Wentworth
Department of Human Nutrition & Foods
VPI & SU
Blacksburg, VA 24061-0228
(703) 231-6943

9. I agree to voluntarily participate in this research project described above and by the researcher.

Signature_____
Date_____

APPENDIX F

Code Sheet and Point Scores Used to Determine Nutritional Quality of Life

Code No.	Question	Score	Frequency
1.	1.	1. 2 pts 2. 1pt	
2.	2.	1. 2 pts 2.	
2. 9. 10.	2. 4. 4.	1. - 2. Yes =3 pts Yes No	
2. 9. 10.	2. 4. 4.	1. - 2. Yes =2 pt Yes Yes	
2. 9. 10.	2. 4. 4.	1. - 2. Yes =1 pt No Yes	
3.-8.	3.		Yes 1. spouse 2. children 3. grandchildren 4. siblings 5. other relatives 6. friends
12.	6.	1. 4 pts 2. 0 pts	
13.	8.	1. 4 pts 2. 3 pts 3. 2 pts 4. 1 pt 5. 0 pts	
14.	9.	1. 0 pts 2. 4 pts	

15.-16.	10.	1. 0 pts 2. 3 pts
21.	12.	1. 0 pts 2. 1 pt
24.	15.	1. 0 pts 2. 1 pt
25. 26	16.1 17.1	1 pt
25. 26.	16.1 17.2	.5 pt
25. 26.	16.2 17.1	1 pt
25. 26.	16.2 17.3	.5 pt
27.	18.	1. 3 pts 2. 2 pts 3. 1 pt
28.	19.	1. 3 pts 2. 2 pts 3. 1 pt 4. 0 pts
29.	20.	1. 2 pts 2. 0 pts
37.	22.	1. 3 pts 2. 2 pts 3. 1 pt 4. 0 pt
38.	23.	1. 3 pts 2. 2 pts 3. 1 pt 4. 0 pts
39.	24.	1. 0 pts 2. 1 pt 3. 3 pts
40.	25.	1. 0 pts 2. 1 pt 3. 3 pts

41.	26.	1. 0 pts 2. 1 pt 3. 3 pts	
42.	27.	1. 0 pts 2. 1 pt 3. 3 pts	
43.	28.	1. 0 pts 2. 1 pt	
45.	7.	1. 0 pts 2. 0 pts 3. 0 pts 4. 0 pts 5. 4 pts	
46.-59.	30.-43.	1. 1 pt 2. 2 pts 3. 3 pts	
60.-68.	44.-52.	1. 4 pts 2. 3 pts 3. 2 pts 4. 1 pt	
69.	53.		Yes
70.	54.		Yes
71.	55.		Yes
72.	56.		Yes
73.	57.		Yes
74.	58.		Yes
75.	59.		Yes
76.	60.		Yes
77.	61.		Yes
78.	62.		Yes
79.	63.		Yes

APPENDIX G

SOCIOECONOMIC SCALE (SE)

1. Add together the assigned point value for codes 1,2,9,10,11,12.
2. Account for recoding of codes 9 & 10, if necessary.
3. Total (add) the above assigned point values to determine SE score.

HEALTH - WELL BEING (H - WB)

1. Add together assigned point values for codes 13,17,18,19,20,21,22,23,24,27,28.
2. Determine point value for codes 25 and 26 based on the if - then analysis.

NUTRITIONAL SCALE (N)

1. Add together the assigned point values for codes 29,37,38,39,40,41,42,43,45.
2. Total of the above codes is the N score.

MOBILITY SCALE (M)

1. Add together assigned point values for codes 46-59.
2. Total of the above codes is the M score.

EMOTIONAL SCALE (E)

1. Add together the assigned point value for codes 60-68.
2. Total of the above codes is the E score.

NUTRITIONAL QUALITY OF LIFE (NQOL)

Add together scores from each of the following scales: Socio-Economic, Health-well being, Nutritional, Mobility, and the Emotional. Their total is the overall score for the nutritional QOL.

APPENDIX H

Recommendations for Scale Development

The modified INQLS was field tested in Richmond and the New River Valley of Virginia. During this field testing, it became evident that even more refining of the scale would be helpful. First, in the Socio-Economic scale, there were several questions that needed to be added. The first question was, "Do you have access to a phone?" The telephone is a major source of communication especially when the elderly is nonambulatory, not able to drive long distances, or requires emergency help. The second question was, "Do you have any hobbies?". Hobbies, at least minimally, require some sort of social interaction. A question needs to be asked concerning the race of the elderly individual for statistical purposes. In Question 3, the available responses should be changed. In this question, answers 1 and 2 are acceptable, but it would be better to combine answers 3, 4, 5, and 6 into answer 3 and label it "others". There was very little response to answers 3 through 6. Question 5 could be omitted because 97% said they had friends or relatives who could help them, and it seems that this question is of little use in the Socio-Economic scale. Also, Question 6 should be modified because 96% said they had adequate funds, and, therefore this question by itself seems to have little use in the Socio-Economic scale. Question 7 was moved to the Nutritional scale for scoring since it seemed more appropriate.

In the Health and Well-being scale there were several suggested improvements to make. There were several questions that needed to be added to this scale. The first question was "Do you have enough teeth to eat what you like." Fifty percent of Americans over the age of 65 do not have a full set of teeth. The second question was "If you have dentures do you wear them?" In Question 9 the word "serious" should be omitted because, during field testing, the word "serious" was misinterpreted by several individuals. Questions 14 and 15 should be combined to read, "How many different kinds of medicine do you take per day? This was done to shorten the questionnaire. In Question 16, it would seem better to return to the original INQLS question using "10 pounds per year". Less than 10 pounds per year is probably not significant weight fluctuations. In Question 18, another response, such as "moderately inactive" should be included. This would increase the possible spectrum of responses.

The Nutritional scale needed several modifications. Additional questions were needed. The first question was "Do you eat most of your meals alone?" This reinforces the validity of the Socio-Economic scale. The second question was "Do you prepare the food?" This question reinforces the validity of the Socio-Economic and Mobility scales. Elderly people who for themselves only and eat alone most of the time, tend not to eat as well. In Question 20, the phrase "within the last year", should be added. This determines if the diet

is currently being followed. It would be better to ask Questions 39-43 in the "24 hour recall style" instead of using the method we did. The method used appeared to be too complicated for some of the participants. By using the 24 hour recall system, any meal skipped could be determined. This could be used to check Question 7 for reliability. Also, Question 29 which describes drinking frequency, could be omitted, since only 22% of the total population drank at all and there was an approximately even distribution among each of the three categories.

The questions in the Mobility scale should be asked in a different manner. It was hard for most of the individuals to give an appropriate answer, and it would have been much easier to score if the following method had been used. Each question could be divided into two parts. The first part should read, "Do you have difficulty doing ____? If the respondent says, "Yes", then the interviewer needs to ask, "How much difficulty?" -- a little? some? a lot?

In the Emotional scale, Questions 45 and 46 could be combined, since there is only a slight difference between the two meanings. This was done to shorten the questionnaire. The questionnaire would be improved by returning question E3 from the original INQLS to the modified INQLS. Question E3, " I act irritable and impatient with myself, for example, talk badly about myself, blame myself for things that happen", was inadvertently deleted from the modified INQLS. Question 52

should be omitted because it is not pertinent to the nutritional QOL.

VITAE

Marty Matthews Lawrence was born August 15, 1954 in Lynchburg, Virginia. She graduated from Westchester Academy in High Point, North Carolina. In 1976, she graduated from the University of North Carolina at Greensboro with a B.S. degree in Home Economics specializing in food service management. She completed a dietetic traineeship at Bowman Gray School of Medicine at Wake Forest University in Winston Salem, North Carolina. Following her traineeship, she became a registered dietitian and remains a member of the American Dietetic Association. In 1978, she began graduate course work for her masters degree at Virginia Tech off-campus program in Richmond, Virginia and in 1982 course work was started in Falls Church, Virginia and on the Virginia Tech campus in Blacksburg. In April of 1987, she married Dale Lawrence of Richmond, Virginia. During the last nine years, she has worked as a Registered Dietitian at Southside Virginia Training Center in Petersburg, Virginia which includes four separate facilities: Southside Virginia Training Center, Central State Hospital, Hiram W. Davis Medical Center, and Barrow Geriatric Treatment Center.

Marty Lawrence