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TITLE PAGE DISSERTATION

UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF PHILOSOPHY IN NURSING

EXERCISE LEVEL AND AGE AS RELATED TO SELF-PERCEIVED PHYSICAL
HEALTH, MENTAL HEALTH, AND SOCIAL HEALTH IN OLDER ADULTS

by

Barbara Jean Leach RN, MSN

A dissertation presented to the
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
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In partial fulfillment of the
requirements for the degree
DOCTOR OF PHILOSOPHY

May, 2003

Dissertation Committee

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Abstract

The purpose of this study was to examine the relationship between the level of exercise and age and self-perception of physical, mental and social health in older adults. Voluntary quota sampling was used to recruit 224 older adults aged 55 and up. The Physical Activity Questionnaire for the Elderly (Voorrips, Ravelli, Dongelmans, Deurenberg, & Van Staveren, 1990) was used to determine the current level of exercise of the older adult. Age was measured using the Demographic Questionnaire by Leach (1999) and self-perception of physical health and mental health was measured using the SF-36 Health Survey by Ware (1993). The Texas Social Behavioral Inventory (Helmreich & Stapp, 1974), was used to assess self-perception of social health. Correlations between the variables were determined and 2 exploratory models were proposed that depicted the relationship between the variables. The relationships in the exploratory models were then analyzed using Multivariate Regression Analysis. A small, positive, significant correlation was found between exercise level and self-perception of physical health ($r = .239, p < .05$) and a moderate, negative, significant correlation was found between age and self-perception of physical health ($r = -.308, p < .05$). Active older adults tend to be more mentally and physically healthy. Exercise is imperative to maintaining good physical functioning. Therefore, it would be beneficial to encourage older adults to engage in some form of regular exercise and to investigate strategies to help keep seniors active.

Preface

As I became more knowledgeable about older adults and the aging process, my feelings about growing older changed from dread to hope and, yes, even excitement about the unknown possibilities that are mine for the taking. I became interested in self-perceptions of older adults after interacting with seniors who seem to have forgotten that they are “up in years” and are not fitting into the mold that society has designed for them through ageist attitudes. A senior couple whom I have known for years tirelessly work around their house and mine, they travel to parts of the world that many people only dream about, and it is hard to catch them home on a Saturday night! They have something that many people would like to have: the enjoyment of life. The more I observed them and other older adults, I realized our youth-oriented society is missing out on a valuable resource- our seniors. This study is a first step towards my goal of helping older people live life to the fullest so that they don’t become a “wasted resource”.

I would like to acknowledge all those who helped me to complete this dissertation. I would like to thank God for giving me strength to keep pressing towards my goal these past ten years. I also would like to thank my family, Gary, Andy, Jody, and Cory for their support and encouragement while I completed this seemingly endless process of writing and rewriting. I would like to thank Patti for weeks of assistance in helping me to find the “right subject for my study” and my husband for hooking me up with a goldmine of participants. Toni and Kathy helped to make this seemingly insurmountable task manageable through their early assistance.

Barbara Leach

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CHAPTER 1

THE PROBLEM

Introduction and Background

The population of the United States is growing older and the percentage of older adults promises to steadily increase as a result of increased longevity and decreased fertility rates. In 1900, the population consisted of 4.9 million people over age 65; this population had increased to 25 million in 1980 (Lookinland & Anson, 1995). There are now more than 36 million seniors in the United States (Hoeger & Hoeger, 1996) and persons over 65 comprise 12.6% of the total population. The number of older adults is expected to double by the year 2030 to about 56 million or 20-22% of the U. S. population (Heliker et al., 1993; Hoeger & Hoeger, 1996; Miller, 1991). In 2020, 6-7 million people are expected to be 85 and older, with 1/2 million living to be 100 (Lookinland & Anson, 1995). The National Institute on Aging predicts that life expectancy in the year 2040 will be 86 years for men and 91 years for women (Miller, 1991).

The 65 and over age group in the United States is growing twice as fast as the rest of the population but, unfortunately, an increasing lifespan does not necessarily equate with a high quality of life (Arent, Landers & Etnier, 1999). The quality of life for aging

Americans may be less than desirable due to the ageist attitudes that prevail in our youth-oriented society. Ageism has been defined as prejudice and discrimination against older people based on the belief that aging makes people less attractive, intelligent and productive (Atchly, 1988; Macionis, 1987). Celejewski and Dion's (1998) research findings suggest that elderly adults as an age group are subject to more negative stereotyping in North American samples than younger adults. In addition, older individuals tend to internalize such false or superficial images of themselves (Butler, 1996). Like a self-fulfilling prophecy, the resulting self-depreciation can affect older Americans' level of wellness and their perceptions of quality of life (Terpstra, Plawecki & Streeter, 1993).

In contrast to this ageist assumption, research has demonstrated that the majority of older adults are capable of engaging in all types of normal physical activity up until the age of 85, and that some individuals do not show universal deterioration as they age (Rowe & Kahn, 1987). However, physical activity tends to decrease with age, with the greatest decline observed among women, and rates of exercise among seniors in general remain low (Conn, 1998; Sharpe, Jackson, White, Vaca, Hickey, Gu, & Otterner, 1997). Data from the 1992 Behavioral Risk Factor Surveillance System study indicates that fewer than 30% of men and 20% of women 65 years of age and older engaged in any type of regular, sustained physical activity 5 times a week for a minimum of 30 minutes at a time. Among people 75 and older, about 38% of men and more than 50% of women reported participating in no leisure time physical activity (Segal, Crespo & Smit, 1998). Similarly, the data from the Healthy People 2010 Review of 2000 demonstrated that 51% of adults aged 65 to 74 years engaged in no physical activity at all.

Low rates of exercise among older Americans is of special concern because engaging in regular exercise has been demonstrated to play a critical role in successful aging (Rowe & Kahn, 1997). Since 1 out of 8 Americans is now 65 years or older and research evidence supports the continued ability of the majority of elders to perform many physical activities at an advanced age, the high prevalence of sedentary seniors is disturbing (Segal, Crespo and Smit, 1998).

Despite their apparent prevalence of low levels of physical activity, older Americans often view the process of aging and their life circumstances positively (Adams-Price, Henley and Hale, 1998; Celejewski & Dion, 1998). Hombergh, Schouten, Van Staveren, Van Amelsvoort, and Kok (1994) state that almost all elderly are in some way physically active, with household chores often comprising a large portion of that activity. Since exercise is one activity that has been reported in the literature as having positive physical, psychological and social effects (Carroll, Pollock, Graves, Leggett, Spitler, & Lowenthal, 1992; Evans, 1998; Focht & Koltyn, 1999), it may prove beneficial to the maintenance of a positive self-image as well as physical health to encourage older adults to participate in some form of regular, sustained physical exercise. Health officials are concerned that the decrease in physical activity among the growing number of American seniors 70 and over will result in a substantial increase in health care costs. Therefore, encouraging sedentary older adults to reverse their present lifestyle choices in regard to physical activity is imperative (Segal, Crespo & Smit, 1998).

Review of the literature revealed a significant amount of evidence regarding the

physical benefits of exercise for adults of all ages (Arent, Landers & Etneir, 1999; Evans, 1998) and, to a lesser degree, its psychological or mental benefits (Clark, 1995; Focht & Koltyn, 1999). Fewer studies regarding the social benefits of exercise for older adults were found. The effect of level of exercise on older adults' self-perceptions of their physical health, mental health, and social health has not yet been examined. There is also a lack of information available regarding the physical activity or exercise preferences of older Americans and appropriate training regimens and patterns of injury in this age group. This knowledge gap often inhibits physicians and other health care providers from encouraging a more active lifestyle (Segal, Crespo & Smit, 1998). This study aims to add to our knowledge base regarding older adults' exercise habits and preferences as well as the effects of exercise on their physical, mental and social health. When health care providers understand which type of exercise older adults prefer and how engaging in regular physical activity affects their self-perceptions, they may feel more inclined to encourage some form of regular exercise for older clients who, in turn, may be more apt to follow an exercise regimen.

Purpose of Study

Because of these findings and the sustained increase in the number of older Americans, it has become imperative that older adults be assisted to evaluate themselves realistically in order to live to their fullest potential. Research has demonstrated that older adults do not experience universal deterioration, that they are capable of engaging in all types of normal activity and that exercise can be highly beneficial. Therefore, the purpose of this study was to examine the relationship between older individuals' degree

of regular exercise and their self-perceptions of their physical health, mental health, and social health. In addition, the relationship between age and self-perceptions of these three aspects of health was identified.

Specific Aims

The 3 specific aims relevant to this study are:

1. To describe the various exercise levels of older adults.
2. To examine the strength and direction of the association between exercise and older adults':
 - a. self-perceptions of physical health
 - b. self-perceptions of mental health
 - c. self-perceptions of social health.
3. To examine the strength and direction of the association between age and older adults':
 - a. self-perceptions of physical health
 - b. self-perceptions of mental health
 - c. self-perceptions of social health.

Statement of Hypotheses

There were 6 relevant hypotheses for this study: (1) exercise level is positively related to self-perception of physical health in older adults; (2) exercise level is positively related to self-perception of mental health in older adults; (3) exercise level is positively related to self-perception of social health in older adults; (4) age is negatively related to self-perception of physical health in older adults; (5) age is negatively related

to self-perception mental health in older adults; and (6) age is negatively related to self-perception of social health in older adults.

Significance of the Study

This study is relevant due to the sheer numbers of older adults projected for the near future in the United States. A projected increase in longevity for both men and women is largely responsible for this future trend. How one feels about oneself will dictate health behaviors and influence perception of quality of life. It will be critical in a society with limited resources and a high proportion of elderly for seniors to remain healthy and functioning as long as possible, keeping the period of terminal decline as brief as possible and the elderly's consumption of health care resources as low as possible.

Recent studies have demonstrated that almost every aspect of the senior's life in American society has been touched by the ageist phenomenon (Rosenbaum & Button, 1993; Robinson & Skill, 1995; Symthe, 1996; Titus, Heinzelman & Boyle, 1995). Prejudice against older adults appears to be deeply rooted in the cognitive processes underlying social perception (Celejewski & Dion, 1998). Despite the fact that society mainly sees aging as negative, elders often view aging in a positive light (Adams-Price, Henley & Hale, 1998), and despite the fact that research findings negate the ageist assumption of universal deterioration in older adults, the prevalence of ageist attitudes in our society make them vulnerable to internalizing these false assumptions, and as a result, perceiving their quality of life as negative. Therefore, it is important that older adults be encouraged to maintain a positive view of the aging process to live their life to

the fullest. The positive effects of exercise may assist the older adult to achieve this goal.

Nelson (1998) documents many success stories regarding the benefits of exercise among older adults. She found that many older adults are interested in participating in an exercise program and that, once they begin it, they become committed to continuing on with some form of exercise. This study will identify the effects of exercise on older adults' perceptions of their health status. If the study hypotheses are supported by the findings, it may be therapeutic to encourage nonexercising older persons with negative perceptions of their quality of life to participate in a form of regular exercise. Exercise, in turn, may then improve their perceptions of themselves and their quality of life. In addition, research has not yet answered the question of how much exercise positively affects self-perceptions of physical, mental, and social health, and what forms of exercise are most beneficial in improving these self-perceptions of older adults.

Theoretical Framework

Expectancy Theory

Expectancy theory provided the theoretical framework for this study. Expectancy theory is concerned with the effects or outcomes of expectations on a person's beliefs, values and behaviors. To expect is to look forward to the probable occurrence of something and expectancy is defined as a state of expecting (Morris, 1973). Bengtson (1995) describes an expectation as an unwritten and informal belief system. This belief system has obligations attached in that one is expected, and

therefore obligated, to feel and behave in the manner dictated by the belief system. In contrast, Mowday and Nam (1997) view expectancy as beliefs or subjective probabilities that certain outcomes are likely to follow from specific types of behavior. These expectancies are subjective probabilities or individual beliefs, not objective likelihoods. They do not need to be realistic or even objectively likely in order for them to influence the beliefs and values that can motivate behavior (Mowday & Nam, 1997).

Different approaches to expectancy theory have been presented in the literature. For example, Mowday and Nam (1997) view expectancy theory as a motivational or cognitive choice theory that focuses on how people make decisions about where to allocate their effort. Bengston (1995) views expectancy theory as a belief system that is expressed informally, to which obligations are attached that have the potential of creating solidarity or conflict. In contrast, Biernat, Vescio, and Billings (1999) approached the theory from the aspect of perceived expectancy violation. This view states that subjectively atypical subjects are rated at the extremes because they do not fit the characteristics considered to be “normal” or, in other words, they violate the established norm. All of these different ways of conceptualizing expectancy theory make similar assumptions about people and share key theoretical variables. Three common assumptions are cited by Mowday and Nam (1997): (1) People have expectations or beliefs about the outcomes of their behavior that range from high to low expectations of performing well; (2) Individuals prefer some outcomes to others; and (3) People behave hedonistically when choosing among different tasks or levels of effort to exert in performing a task.

A major concept of expectancy theory is the valence of outcomes, the value or anticipated satisfaction that comes from different possible outcomes of our behavior (Mowday & Nam, 1997). In the present study, expectancies of older adults which influence self-perceptions and ultimately behavior, were investigated using this concept of valence of outcomes to ask the question about how motivated the participants are to keep their physical, mental, and social self healthy through exercise and what outcomes do the participants expect from regular exercise- both positive and negative. Expecting certain outcomes from a behavior can influence persons' beliefs concerning the importance of performing that behavior, their ability to achieve the outcome, and their desire to do so. How much persons value themselves can influence their motivation to maintain their health. The benefits of exercise for older adults have been well documented in the literature by various authors (Clark 1996; Evans 1998; Focht and Koltyn 1999; Resnick 2000). Exercise level will be investigated as a motivational, independent variable that influences older adults' self-perceptions of themselves.

Empowerment Concept

Exercise may have an empowering effect on older adults that enables them to view themselves more positively. Therefore, the concept of empowerment also contributed to the theoretical foundation for this study. Freire (1987) utilized critical theory to propose the use of empowerment as a pedagogic approach. According to Freire, critical theory first must be used to uncover self-perceptions or expectations and their effects on a person's beliefs and behaviors. When these perceptions or expectations are revealed, older adults can be empowered to view their lives more

positively, and this may lead to a healthier life-style. Freire indicated that a person provided with the proper tools can more clearly perceive his/her personal and social reality (as well as the contradictions in it), and then deal more consciously with it.

Empowerment is a concept that can be used to help older adults to achieve positive views of their lives and ultimately, healthier life-styles. Fleury (1991) defined empowerment as a process of individual growth resulting from goal directed behavior that facilitates the emergence of new and positive behaviors. This process can help to produce feelings of well-being and self-worth, as well as the perception of having control over one's life. Empowerment interventions can be used to help produce positive self-perceptions that can have a positive effect on older adults' health promoting behaviors and ultimately their perception of their quality of life. Since the literature has supported the positive effects of exercise on physical, mental, and social health, this theory suggests that exercise can be empowering for older adults. Therefore, nonexercising older adults' participation in regular exercise may result in the positive mental health outcome of a sense of empowerment that will result in other more positive self-perceptions.

Definition of Terms

The following terms are defined for the purposes of this dissertation.

Perception of Physical Health

A person's view of his/her physiological well-being, physical energy and strength, and level of physical activity in the form of ADLs, leisure-time activities, and sports (Leach, 1999; Farrell, 1990). This variable was operationally defined as scores

on the Physical Component Scale (PCS) of the SF-36 Health Survey (Ware, 1997).

Perception of Mental Health

A person's view of his/her psychological well-being, adaptability or flexibility, coping, productivity, competence and vitality (Farrell, 1990; Leach, 1999). This variable was operationally defined as scores on the Mental Component Scale (MCS) of the SF-36 Health Survey (Ware, 1997).

Perception of Social Health

A person's view of his/her self-image, sexuality, social interaction and relationships, usefulness, role, social support, and assertiveness (Leach, 1999; Farrell, 1990). This variable was operationally defined as scores on the Texas Social Behavioral Inventory (Heimreich & Stapp, 1974).

Age

Number of years a person has lived. This variable was operationally defined as scores for the age and age felt items in the Demographic Data Questionnaire (Leach, 1999).

Level of Exercise

The amount or degree of physical exertion outside of the ordinary tasks of daily living. It may include sports, aerobic or anaerobic activity, or any form of physical activity (Golomb, Solidum, & Warren, 1997). Three levels of exercise were measured:

Level 1: Activities of Daily Living (ADLs). Those self-care activities that must be accomplished each day in order for the person to care for his own needs. ADLs include personal hygiene, dressing, eating, toileting,

getting in and out of bed, using a wheelchair, ambulating, and performing manual tasks, ie. folding down bed sheets before getting into bed (Brunner & Suddarth, 1984). ADLs were operationally defined as scores on the Physical Activity Questionnaire for the Elderly (Voorrips, Ravelli, Dongelmans, Deurenberg, Van Stavern, 1990), and as scores for exercise activities and ADL ability in the Demographic Data Questionnaire (Leach, 1999).

Level 2. Low Impact Level. The degree of influence that a specific, regularly engaged in, moderate physical activity (above and beyond ADLs), has on the muscular and skeletal systems. Low impact activities produce a small amount of tension in muscles and on bones, and include activities such as leisure walking, gardening, and household activities (Powell, Heath, Kresnow, Sacks, & Branche, 1997). This level of the variable was operationally defined as a summed score on the Physical Activity Questionnaire for the Elderly (Voorrips et al., 1990).

Level 3. High Impact Level. The greater degree of influence that a specific, regularly engaged in, strenuous physical activity has on the muscular and skeletal systems in the form of tension in muscles and on bones. High impact activities included such things as swimming, tennis, or jogging. This level of the variable was operationally defined as a summed score on the Physical Activity Questionnaire for the Elderly (Voorrips et al., 1990)

Table 1

Methods to Operationally Define Variables

Variable	Measurement Tools
Perception of Physical Health	*SF-36 Health Survey (Ware, 1993)
Perception of Mental Health	*SF-36 Health Survey (Ware, 1993)
Perception of Social Health	*Texas Social Behavioral Inventory (Heimreich & Stapp, 1974)
Level of Exercise	*Physical Activity Questionnaire for the Elderly (Voorrips, et. al., 1990)
ADL (Leach,	*Physical Activity Questionnaire for the Elderly (Voorrips, et. al., 1990) *Demographic Data Questionnaire 1999)
Exercise Intensity	*Physical Activity Questionnaire for the Elderly (Voorrips, et. al., 1990)
Age (Leach,	*Demographic Data Questionnaire 1999)

CHAPTER 2

REVIEW OF RELEVANT LITERATURE

A brief review of recently funded studies is initially presented to determine the scope of research that has been conducted in the area of interest. Relevant literature is reviewed concerning older adults' perceptions of themselves and the perceptions that society holds regarding them. Literature regarding individual perceptions and societal perceptions of aging are compared and contrasted and the effects of exercise on physical health, mental health, and social health are explored.

Recently Funded Research

The website for the Institute of Aging, a division of the National Institute of Health, was visited to review the grants awarded for research in the past 5 years. The purpose of this was to establish whether the proposed relationship between the independent variable exercise and the dependent variables self-perceptions of physical, mental and social health in older adults has recently been investigated. The findings from this investigation and from a literature review revealed that, to date, these variables have not been studied together.

Review of the website revealed a substantial amount of funding granted for

research on the decline of cognition and, to a lesser degree, on strategies to improve cognition and communication in the older population. Examples of studies conducted, similar to the proposed study are presented in this section. These studies investigated factors that affect physical, mental, and social health and potential strategies to enhance well-being and functioning in these areas.

Aldwin (1997) developed ways of empirically clustering types of nonlinear mental and physical health trajectories, using 30 years of data from a Normative Aging Study, and described both types of existing patterns with the frequency of their occurrence. In addition to looking at cohort differences in these trajectories, the Normative Aging Study's data was used to determine if these trajectories are a function of personality, socioeconomic factors or health behavior habits. The present study was also concerned with examining the variables of mental and physical health in relation to the health behavior of exercise.

In 1997, Field investigated strategies to improve psychological well-being, using data collected over 50 years from the Berkley Older Generation Study. Continuity and change in social relations during old age was assessed, along with the influence of within-family and beyond-family relations on psychological well-being. In a similar study, Krause (1997) found that the support provided by a significant other is a strategy that can offset the impact of salient role stressors by improving role specific feelings of control and self-worth.

Another study similar to the proposed study was conducted by Mcauley (1997) which examined the relationship between exercise, aging, and psychosocial functioning.

More specifically, this study examined the role aerobic exercise played in enhancing the psychosocial and cognitive functioning of 200 adults aged 60-74. It was hypothesized that the aerobic exercise program would substantially increase physical fitness, which would, in turn, result in improved cognitive function in relation to memory and attention and improved psychosocial function in relation to psychological well-being and self-efficacy. This study differs from the present study in the how the dependent variables were measured. In the present study, the influence of exercise level on perception of physical health, perception of mental health and perception of social health was measured whereas in Mcauley's study, the influence of an aerobic exercise program on physical fitness/physical health was measured, along with the resulting influence of physical fitness on cognitive functioning. Another difference is in the independent variable of exercise. In the present study, various levels of exercise were measured in addition to the aerobic form which was the only level used as the independent variable in Mcauley's design. Also, the age of the participants were not limited to 60-74 years old but ranged from age 55 on up.

Self-Perceptions of Older Adults

Self-perceptions of aging refers to how older people feel about themselves and how they see themselves in relation to others (Tien-Hyatt, 1987). Varying combinations of cultural, psychosocial and physiological variables affect self-perceptions of aging. These variables fall into 2 categories: personal variables such as physical attractiveness, self-control, and self-confidence, and general variables such as marital status, socioeconomic status, and level of activity (Tien-Hyatt, 1987).

Tien-Hyatt (1987) investigated how older adults perceive themselves in the midst of cultural change. Three subgroups of female community residents aged 60-75 participated in this study. These subgroups included Chinese in Taiwan, Chinese-Americans and Anglo-Americans. All 3 subgroups were found to have positive self-perceptions of aging. The Anglo-Americans' self-perceptions were the most positive, followed by the Chinese-Americans; the elderly Chinese women in Taiwan demonstrated the least positive self-perceptions of aging. However, all 3 groups reported that they felt content with their lives. Celejewski and Dion (1998) found that elders tend to hold negative beliefs about life circumstances of the aged when evaluating elderly people in general or a prototypical member of this age category. However, when older adults assess their own life circumstances, their judgments are usually more positive.

Katzko, Steverink, Dittman-Kohli, and Herrera (1999) found that older adults view themselves in a positive light. Developmental tasks of the older population were described as involving a search for new ways to continue leading a meaningful life once initial goals they set have been achieved. Older adults evidenced meeting these tasks by viewing themselves as still-healthy individuals in search of ways to fill their time with meaningful activity. It was also found that these older adults were not concerned with coping or adjustment strategies, nor were they concerned over the sorts of losses that would require these strategies.

Many studies have reported that the vast majority of older people, even those older than 80, feel considerably younger than their years. For example, in a sample of

seventeen elders, health status was found to play a major role in their self-perceptions since the poorer their level of health, the older these elders felt themselves to be (Adams-Prices, Henley, and Hale, 1998). These researchers also found that the older people in their sample sometimes confused symptoms of acute illness with signs of aging, and that depression negatively affected their ability to find meaning in life. Keller, Leventhal and Larson (1989) asked a small sample of older adults to describe the meaning of aging. Most participants described aging as a slow, natural process with the benefit of having additional time for contemplation and accrual of wisdom. However, 7 out of 32 respondents viewed aging as negative and nearly all reported something negative about the signs of aging seen in themselves and in others. Despite these findings, it is apparent from the literature review that older adults overall tend to view themselves positively. Most recent research findings support the idea that older adults generally have not internalized society's negative view of aging.

Societal Perceptions of Older Adults

Perceptions of Young Adults

As previously stated, older adults often view the aging process positively even though society tends to see it in a negative light (Adams-Price, Henley, & Hale, 1998). Celejewski and Dion (1998) found that the level of control and satisfaction that is personally experienced among older adults is higher than that attributed to older people by other members of society. In a study by Adams-Price, Henley and Hale (1998), college students were found to focus on the physical changes associated with aging and described aging as involving unfavorable weight changes, decreased mobility and

agility and hair loss, as well as increased responsibility and lost freedom. Older adults, on the other hand, focused on the spiritual domain, speaking favorably of aging, especially in conjunction with God, church, and religion. In addition, older adults associated aging with everyday events or no events at all, whereas the younger adults associated aging with major events in their lives; and even though these events tended to be positive, aging had a negative meaning for them.

Influence of Ageism on Societal Perceptions

Many negative stereotypes concerning older adults can be found in the literature. Often these stereotypes are a result of ageist attitudes. Ageism has been defined as prejudices and discrimination against older people based on the belief that aging makes people less attractive, intelligent and productive (Atchly, 1988; Macionis, 1987). Stanley and Beare (1995) agree that ageism promotes discrimination against older adults based on preconceived attitudes that are generalized to the older population as a whole. Fontaine and Fletcher (1995) and Townsend (1996) see stereotyping of older adults as creating social discrimination against older people in the same manner as ageism. This discrimination is seen in both societal attitudes and behavior towards older adults. Negative stereotypes or ageist attitudes exist in society at large, in the health care professions in general, and more specifically in nursing.

Media perceptions. Review of the literature has demonstrated that almost every aspect of the senior's life has been touched by the ageist phenomenon. The reason for this may lie in the fact that the aging process has been defined in negative terms by modern society (Levy, 2001; Zebrowitz & Montepare, 2000). Negative images of older

adults abound in the media, suggesting that aging is an undesirable and negative process. Commercials often depict seniors as feeble and foolish, with nothing better to do than sit in their rocking chairs (Symthe, 1996). Robinson and Skill (1995) feel that television characters over 65 continue to be an “invisible generation”. Older persons are also depicted in the media as trusting, compliant victims of crimes (Titus, Henzelman, & Boyle, 1995), an economic burden, an economically selfish voting bloc, a generationally divisive influence, and an unconstructive community element (Rosenbaum & Button, 1993).

Negative stereotyping. Other studies have demonstrated negative stereotyping of older adults by people of all age groups, including elders themselves. In a study conducted by Hummert, Garstka, Shaner, and Strahm (1995) participants of all ages chose the older age ranges for the more negative stereotypes and the younger age ranges for the more positive stereotypes. Ageism was also found to exist in the patronizing language often used in communicating with older adults (Hummert, 1994). In addition, Evans (1995) reports that ageism exists in religious communities. She found that many clergy feel that any chance for advancement disappears with the 50th birthday.

Gender and Class. Estes (1991) found that gender and class were contributing factors to negative feelings towards older adults. She found that working class elders were more rapidly devalued in the labor market and in society as a whole than were aged of other classes. Estes also found that women, whose labor is not generally considered productive when not employed outside of the home, were more devalued than men in old age.

Employment and residence. The effects of ageism are strongly felt in the areas of employment and place of residence. The biggest concern in the work arena is limited opportunities for employment as a result of the false assumptions that senescence is equivalent to senility and that a person's ability can be measured by the number of his/her years. Forced retirement is another by-product of these assumptions.

Even the residences older Americans are forced to live in due to economic and social conditions reflect ageism. This is seen in the negative depiction being given nursing homes by the media and the increasing acceptance of them by politicians as a solution to the problem of what to do with the older adult to avoid other costly solutions for their care (Kleemeier,1977). Kleemeier also reports that most older Americans prefer to live in retirement homes or to remain in their own homes. The freedom to choose where to live often grows narrower as a person grows older due to such factors as increasing real estate taxes that older adults on fixed incomes often cannot afford, which force older persons out of their homes. This contributes to older persons ultimately becoming dependent on public support.

Societal expectations. Research has identified societal expectations held for the older adult that reflect ageist attitudes. Bengtson (1995) defines expectation as being unwritten and informal and as having obligations attached. Expectations can create solidarity or conflict and, when related to ageist attitudes, they often create conflict for the older adult. Herrick, Pearcey and Ross (1997) state that the elderly are often blamed for soaring health care costs, as they are expected to be the primary users of the system. Older adults are also blamed for the decline of the American economy due to the belief

that the government spends too much on older people and not enough on the young (Butler, 1996). An older adult's productivity is expected to decline with age (Cofer, 1998) and they have been described as "unproductive spendthrifts with money to burn, who selfishly insulate themselves in retirement communities" (Butler, 1996).

Physical and mental deterioration is expected with aging. Inevitable mental deterioration is expected which is felt to be untreatable (Dahl, 1992). Blanchette (1996-1997) presents a description of older adults as "demented oldsters avariciously consuming the legacy of our children". Older adults are seen as uncaring, as people who "inevitably vote against programs for children" (Butler, 1996). It is expected that old age automatically makes one a "patient" and that being old is sufficient reason to bow out of life because one is no longer fully viable (Ebersole, 1997). Caring for elders is often considered futile because they are inflexible, hard to motivate, noncompliant, and too old to learn new coping skills (Cofer, 1998; Herrick, Pearcey, & Ross, 1997; Richards, 1994;).

Age is also often conceptualized by the general population as equivalent to decline and deterioration with regards to physical health (Estes, 1991). Older adults have been depicted as feeble (Smythe, 1996), sick, dependent, helpless, childlike, senile, and as a burden on the young (Friedman, 1993). Some have even gone as far as to suggest that older adults have a "duty to die" to allow the next generation to build their lives (Prado, 1990; Scheewind, 1994).

Contemporary health care. Since ageism cuts across all aspects of American culture, it can also be identified in contemporary health care. Like the general

population, health care providers often ascribe to negative stereotypes of older adults. Lookinland and Anson (1995) report that health care providers may be particularly vulnerable to adopting ageist attitudes because of their increased exposure to ill and infirm older adults. Prejudices against persons of advanced years are often evident in the way older adults are treated and in the services available for them. Studies conducted over the past 35 years have focused on how various health care providers viewed aging clients (Belgrave, 1993; Cumming & Henry, 1961; Langer & Rodin, 1980). Physicians, occupational and recreational therapists, rehabilitation counselors, mental health professionals, nurses, and gerontologists have all been found to view older people as childlike, mentally incompetent, lonely, dependent, powerless, passive, miserable, and sick, as well as having regressed to earlier developmental stages (Benedict & Ganikos, 1981; Buckwalter, Smith, & Martin, 1993; Haight, Christ, & Dias, 1994). Geropsychologist, David Gutman has been cited as believing that the science of gerontology has shared, worked within, and perpetuated the conventional view of aging as catastrophic and aging as a “wasteland” (Friedman, 1993).

There are currently two views of aging held by gerontologists (Friedman, 1993). The first view considers aging to be a pathological process in which the following are unavoidable: a decrease in cerebral circulation which leads to senility; regression and rigidity; an impaired capacity to metabolize glucose which increases the incidence of strokes; and bone decline ending in osteoporosis. Generally, when older people do not display the expected pathologies, it is dismissed as an accident of heredity.

The second perspective of aging currently held by gerontologists views the older adult

in a more positive light. Aging is described as a state of being and becoming, not merely an ending. Major longitudinal studies done throughout the United States in the past 25 years found that no decline occurs in intelligence of older adults. In fact, some older individuals actually show an improvement. There is growing evidence that cognitive loss may actually result from factors other than aging, such as lack of education and, therefore, may be preventable. In addition, it is thought that some declines attributed to normal aging may be related to environmental conditions, since they do not occur in certain environments. Maverick gerontologists have been proposing that the long period of years of life after reproduction is as important as the long period of childhood in making us human (Friedman, 1993).

Ageism is also evident in the treatment modalities offered older adults. Doctors have displayed a prejudice toward older adults through the kind of treatment provided or the lack of treatment given. For example, there has been talk in the medical community about providing only hospice-like care to older adults (Binstock & Pot, 1991). Callahan (1987) feels that the aged must recognize their obligations to others, one of which is to help cut health care costs by “bowing out gracefully without a fight.” Lillard (1982) reports that it is felt by some that caring, in the sense of providing ongoing support to elderly patients who have no chance of cure, should be given low priority.

Ageism has also been found to play a role in inappropriate diagnoses being assigned to older clients. Friedman (1993) described a study of “pathological” behavior assigned to older clients which revealed that, if the patient was described as being in

his/her 60's or 70's, doctors were more likely to diagnose the patient with an "organically based" impairment requiring drug treatment or institutionalization than if he/she were younger. Dr. Richard Bedside of Harvard Medical School estimated that misdiagnosis of "irreversible dementia" may account for 300,000 wasted lives and 100,000 needless institutionalizations per year (Friedman, 1993). In addition, Cohen (2001) reported that the highest-rated ageist encounters described by older adults involved the medical arena. For example, 42% of older adults in Cohen's study stated that doctors and nurses assumed their ailments were solely caused by age.

Services available for older Americans also reflect negative expectations that are associated with ageism. The underlying problem is that these services are costly. Doctors and other health care providers often prefer not to see people over 65 on Medicare or Medicaid as it is not profitable (Scheewind, 1994). Prado (1990) supports the idea of setting limits on the length of life by condoning elderly suicide or by limiting medical treatment. In addition, Scheewind (1994) reports that some members of the medical community believe that older adults should receive less expensive treatments rather than cutting edge technology and that no life extending procedures should be performed.

Nursing. According to Lillard (1982), nurses are products of their environments; therefore, they often reflect societal views and attitudes. Seymour (1994) states that, in both her professional and personal experience, ageism is alive and well among nurses, nursing students and teachers of nursing.

Many nurses tend to base their views on the small percentage of institutionalized

elderly they have encountered. Numerous researchers are aware that ageism is a major factor in nursing's inadequate response to the needs of the elderly and that it is a real threat to the care of the aged (Lillard, 1982; Estes, 1991). Several factors have been found to influence the nurse's perception and treatment of older adults. Often nurses feel a sense of hopelessness in their ability to meet the magnitude of needs they perceive older clients to have (Wright, 1995). The sex of the nurse also seems to play a role in ageist attitudes since Haight, Christ and Dias (1994) found that male nurses demonstrated more unfavorable responses toward caring for older adults.

Age of the nurse is another influencing factor. Lookinland and Anson (1995) found that middle-aged and younger RNs expressed more negative stereotypical views about older people than older nurses (Lookinland & Anson, 1995). These researchers also found that current and future health care workers expressed strong feelings of discomfort in the presence of old people, which reflected an "emotional rejection" of older adults.

As a result of this negative stereotyping, Haight, Christ, and Dias (1994) state that graduate programs in gerontological nursing in the United States are in crisis. Though these programs are well-funded, they often close because students cannot be recruited to enter this specialty area. Only 1 out of 57 graduating nursing students chose to work with older adults. The reason cited for this reluctance was the perception that the older client doesn't usually get well and is isolated and dependent (Haight, Christ, & Dias, 1994).

A pilot mini-study was recently performed by Leach (1999) to determine

expectations that nursing students held about older adults. The convenience sample included 8 first year Associate Degree nursing students who were currently enrolled in a pediatric clinical rotation. No formal class focusing on the health care of older adults had yet been taken. The age of the 6 female students ranged from 21 to 30, and the 2 males were 29 and 30 years old. The students identified both positive and negative expectations of older adults, but the majority of expectations were negative. Of the total 67 responses to the questionnaire concerning perceptions of older adults, 30% were positive while 70% were negative. The responses fell into 3 distinct categories of physical expectations, psychological expectations, and social expectations.

The students' positive expectations fell into the psychological and social categories. Older adults were seen by some as pleasant, sweet, and as having a sense of humor or an increased wit. It was also felt that older adults can "feel good about themselves" and that they are more patient. Some students felt that older persons had increased knowledge and experience, and that they were critical thinkers who are "full of wisdom". Various positive expectations of older adults' social interaction were also expressed. Older adults were perceived as having more tolerance when interacting with young people and as "enjoying interacting with their grandchildren". They were seen as being able to entertain themselves and as being involved in a variety of social activities, such as shopping and traveling.

Few positive expectations were expressed however, concerning the physical state of the older population. Negative expectations were expressed more than twice the rate of positive responses. Examples of negative perceptions in the physical category

included that older adults are unattractive and smelly; in the psychological category, that seniors are depressed, prejudiced, and mistrusting, and in the social category, that older adults are aggressive, lack understanding of others, and have a decreased tolerance for people their own age. Societal perceptions of older Americans are not all negative, but these nursing students reflected societal expectations since their less positive expectations outweighed the more positive ones, especially in the physical category.

Ageism in the new millennium. Cohen (2001) states that today there exists a deep-seated cultural set of values that promote the intrinsic devaluation of old age by society at large, and older adults tend to “buy-into” these ageist values. Ageist assumptions will continue to exist until older adults are viewed more positively by society.

The large number of baby boomers moving into the older adult phase in the near future will hopefully play a pivotal role in the demise of ageist assumptions. Beginning steps toward elimination of ageist assumptions have already begun. Today, legislation has been implemented regarding age discrimination in employment and in some other areas related to the welfare of older adults. It is evident that some ageism has now moved from the arena of morality and moral obligation to the arena of legal obligation (Cohen, 2001). In addition, Palmore (2001) has developed a tool to measure whether ageism has been experienced by an older individual. These are small but important beginning attempts to eliminate ageism.

Today it may be more difficult to distinguish ageist ideals from attempts to provide helpful services for older adults. For example, Cohen (2001) questions whether

senior discounts and early bird specials are reflections of ageism and whether seniors are holding to the ageist ideal of the necessity of staying young, active, and vigorous as evidenced by ads portraying super-elders water skiing, playing polo, and tennis. Cohen also proposes that actual crime against elderly persons was not off the charts, but it was the fear of crime that was more prevalent than the incidence of crime. Using this analogy, Cohen (2001) suggests it might be that perceptions of ageism by older adults may outstrip the event.

Exercise

Mounting evidence indicates that physical activity is a key factor in preserving physical ability in old age, that a sedentary life hastens decline in physical functioning and predicts an excess mortality risk, and that even low intensity activity imparts benefits among previously sedentary people (Sharpe et al., 1997). The following review of the literature indicates that, in general, the benefits of exercise or physical activity for older adults outweigh the risks.

Amount and Type of Exercise Required

The amount and type of exercise required to elicit the benefits of exercise for older adults has been debated in the literature. It has generally been accepted that a regular, moderate-level, low intensity exercise regimen is most beneficial for older adults. The Surgeon General, the American Heart Association, the Centers for Disease Control and Prevention, and the American College of Sports Medicine all emphasize that health benefits do not require highly strenuous activity, but will accrue from participation in activities of moderate intensity (Powell, Heath, Kresnow, Sacks, &

Branche, 1998). McMurray, Ainsworth, Horrell, Griggs, and Williams (1998) also state that moderate-level physical activity has been found to be all that's needed and that high levels provide no further benefits. These researchers conducted a 5-year cross-sectional intervention trial with a sample of 1,664 Basic Law Enforcement Trainees (BLET) from programs at 25 sites located throughout North Carolina. The subjects were randomly assigned to 3 intervention groups. The first group ($n=816$) was subjected to a highly structured fitness program developed by the researcher and participated in a 9 week supervised exercise program. This program included 27 hours of physical activity administered in 1 hour blocks 3 times a week. Each session involved a warm-up, an aerobic session of running, cycling, or a calisthenics circuit, resistance exercises, and a cool down. The second group ($n= 691$) participated in a standard exercise program devised by the local unit which emphasized resistance training with limited attention focused on aerobic training. The third group (the control group; $n=167$) received no exercise program at all. All exercise programs were delivered by law enforcement officers who were trained as fitness instructors. The researchers found that small increases in aerobic power may ameliorate the cardiovascular disease risk profile by potentially lowering cholesterol and blood pressure. As a result, they propose that physical activity should be of sufficient intensity to increase aerobic power for it to have a positive impact on cardiovascular disease risk. Cardiovascular disease is one of the current major causes of death in aging populations in developed countries such as the United states (Davidhizar, Eshlerman, & Moody, 2002); therefore, appropriate levels of aerobic exercise may provide health benefits to older adults by reducing cardiovascular

disease risks.

Other research has indicated that low impact, moderate-level exercise is most beneficial to older adults (Carroll, Pollock, Graves, Leggett, Spitler, & Lowenthal, 1992; Nelson, 1998). Nelson (1998) investigated the use of weight training for improving physical strength in fifteen older adults residing in an extended care facility. Inclusion criteria included the mandatory use of a cane or a walker to ambulate. Upon completion of the study, a few seniors no longer needed a cane to walk or no longer needed a walker. This low impact weight training regimen was so well received by the participants that they continued on with the program after the research was completed. Carroll et al. (1992) also suggest that a low impact, moderate-level of exercise is best tolerated injury-wise and is more attractive to older adults while providing both mental and fitness benefits. In their study, a lower rate of injury occurred with low impact exercises such as walking, than with high impact exercises such as jogging. With low impact exercise the risk of orthopedic injury was reduced, along with the possibility of aggravating an existing orthopedic condition. It is considered to be generally safe for older adults to engage in such a level of light exercise and physical activity (Ellingson & Conn, 2000).

Information on the amount of exercise required to maintain the health of older adults is not as abundant as is information concerning the type of exercise best suited for seniors. Resnick (2000) reports that more beneficial effects were seen with regular exercise than with exercise performed sporadically. Regular exercise is considered to consist of a minimum of 20 minutes of continuous physical activity at least three times

per week. Finally, research suggests that the benefits of regular exercise may even accrue to sedentary elderly who begin to exercise at an advanced age (Edward & Larson, 1992; Nelson, 1999).

Level of Exercise Among Older Adults

Rates of exercise among older adults remain low (Conn, 1998). Less than 1/3 of older adults exercise regularly and less than 10% exercise vigorously (Barry & Eathorne, 1994). Edward and Larson (1992) found that 50% of older adults who are not physically active have no intention of starting a regular exercise program to increase their activity level. According to the United States Department of Health and Human Services (2000), as people aged they tended not to participate in any leisure time physical activity. The Department reported that 42% of people 45 to 64 years, 51% of people 65-74 years and 65% of people 75 and older in the United States followed this pattern. A small percentage of this population participated in regular, moderate-level physical activity, such as walking and gardening: 30% aged 45-64, 31% aged 65-74, and 23% aged 75 and older.

In addition, approximately 50% of sedentary older adults who do start exercise programs stop them within the first six months of involvement (Ettinger, Burns, Messier, Applegate, Rejeski, Morgan, Shumaker, Berry, O'Toole, Monu, & Craven, 1997). It is important to determine what factors play a role in older adults' decisions to not engage in exercise activities, as well as the factors associated with the high attrition rate among those who do start exercise programs.

Factors Affecting Exercise Behavior

A growing body of research has been reported concerning the physical, social, and psychological factors that affect the extent to which older adults engage in physical activity. Physical factors include physical disabilities, low functional status and high incidence of chronic disease (Evans, 1998; Homborgh, Schouten, Van Staveren, Van Amelsvoort, & Kok, 1995). Specific disease entities that affect exercise participation include arthritis, osteoporosis, and chronic obstructive pulmonary disease. Natural pathological changes occurring with age can also affect exercising behavior. These changes include lower skeletal muscle glycogen stores as compared to younger people, loss of muscle mass, and muscle weakness (Evans, 1998).

Socioeconomic variables also play a role in the type and amount of exercise older adults participate in. Sharpe et al. (1997) found that activity levels decline with age and are particularly low for female, low income, and under-educated people. On the other hand, Clark (1995) reports that there are no gender differences in either exercise frequency or outcome expectancies among older adults. Dependence in mobility and personal care are also factors affecting exercise behavior. Sharpe et al. (1997) found that these two conditions are more prevalent among both African American and Caucasian older adults living in the southern United States than in other regions of the country. In the Homborgh et al. (1995) study concerning habitual physical activity in noninstitutionalized elderly, interviews were conducted and the Physical Activity Questionnaire for the Elderly was administered to 996 seniors. Characteristics of inactive elderly were identified and a profile was composed of the

most inactive among them. The researchers found that perceived level of social functioning played a role in the decision to participate in physical activities.

Several psychological factors affect exercising behaviors of older people. Clark (1996) interviewed older adults concerning their perceptions about their ability to exercise. It was found that outcome expectancies for exercising are low among older adults simply because they feel that they are old. Some responses included, "At my age, what can I expect?", and "You are getting old and there is nothing you can do about it!" Two other psychological factors that have been found to affect exercise behaviors of older people include perceived health and subjective feelings of well-being (Homborgh et al., 1995).

Injury Rates

Injuries among older adults engaged in moderate-level physical activity are uncommon but, when they do occur, many are so minor as to require no treatment or reduction in activity. In Powell, Heath, Kresnow, Sacks, and Branche's (1998) study, the 1994 Injury Control and Risk Survey was administered to 5,238 people 18 years and older in all 50 states via random-digit dialing of U.S. residential telephone numbers. Most injuries reported by all age groups were slight, with about 1/2 resulting from walking, gardening or bicycling. Interestingly, the researchers also found persons 45 years or older to be significantly less likely to be injured while walking or gardening than younger persons.

Carroll et al. (1992) investigated the effect of 26 weeks of moderate and high intensity walking training on injury rates in the elderly. Twenty-eight healthy

volunteers were recruited and assigned to 1 of 3 groups: the moderate intensity group, the high intensity group, or the control group. To achieve the prescribed training intensity, subjects walked uphill on a treadmill. The researchers found that injuries most commonly occurred with high impact exercises such as jogging. These injuries included tendonitis, shin pain, ankle and foot aggravation of an arthritic condition, groin-hip flexor pain, and lower leg pain from a pinched nerve.

Exercise and Physical Health

Many physical benefits of exercise have been documented in the literature. Clark (1996) found that older adults who exercised reported that they slept better, had a better appetite, and that they felt they were able to avoid or delay acute health events by regular exercise. Hombergh et al. (1995) and Birkel (1998) reported that exercising older adults had improved functional capacities and were able to prevent the occurrence of disability diseases. Musculoskeletal benefits of exercise include improved strength, flexibility, balance, joint range of motion and function, and enhanced muscular performance, (Birkel, 1998; Pollock, et al., 1998; Top, Mikesky, Wigglesworth, Holt, & Edwards, 1993).

Other benefits related to physiological functioning include a decreased risk of diabetes mellitus, osteoporotic bone fractures in postmenopausal women, coronary heart disease, hypertension, and colon cancer (Evans, 1998; Powell, et al., 1998). Research has demonstrated an increase in maximal cardiac output, improved glucose tolerance and increased fitness levels associated with reduced mortality and increased life expectancy among exercising adults (Evans, 1998). Segal, Crespo, and Smit (1998)

state that physical inactivity can lead to chronic diseases, premature aging, loss of physical independence, and premature mortality. The benefits of exercise are not limited only to older adults who have a history of regular exercise, but may be accrued by formerly sedentary and unfit individuals when they become active. The downward spiral of impairment may be halted and reversed in formerly inactive seniors (Segal, et al., 1998).

Spiriduso and Cronin (2001) investigated factors that influenced older adults' perception of their physical health. These researchers studied physical functioning and well-being in older adults. They found that levels of physical functioning in older adults were related to feelings of well-being. Exercise was frequently reported by participants to be a positive influence on age-related changes of physical functioning. Low physical activity levels were strongly related to physical disability (Spiriduso & Cronin, 2001).

Chen, Synder, and Krichbaum (2001) also suggest that a significant relationship exists between physical activity and physical functioning. These investigators found that physically active older adults maintain healthy functioning longer than do their sedentary peers and propose that Tai Chi exercises for older adults are a beneficial activity to maintain physical health. Cooper, Bilbrew, Dubbert, Kerr, and Kirchner (2001) found that the greater the physical activity score, the more favorable the self-perception of overall health in 212 older adults aged 60 to 80 years. Van Heuvelen, Kempen, Ormel, and Rispen (1998) state that physical fitness is considered to be a function of age and leisure-time physical activity.

On the other hand, perceived physical health has been found to have the opposite effect on physical activity level. Shephard (1994) studied barriers to exercise in a sample of elderly and found that negative perceptions of health state is a common barrier to exercise.

Exercise and Mental Health

Exercise has also been found to be beneficial for mental health. Many of the following studies focused on the adult population in general; however, the findings may also be applicable to seniors. The research demonstrates that exercise significantly reduces anxiety levels (Focht & Koltyn, 1999; Landers & Petruzzello, 1994; Powell et al., 1998). Depression is also positively affected by exercise.

Osness and Mulligan (1998) found an inverse relationship between exercise and depression: the greater the amount of physical activity, the lower the risk for depression and its symptoms. The National Institute of Mental Health has called depression among seniors a public health crisis. It is the leading risk factor for suicide in this age group. Depression is a biologically-based illness that can and should be treated (Powell et al., 1998). Spirduso and Cronin (2001) proposed that frequent exercising may benefit mood in older adults. These investigators found that older adults 60-75 years of age had fewer anxiety and depressive symptoms and higher self-efficacy after they had adopted a new physical activity and maintained it for 6 months. Moderate exercise is one low-cost/low-risk modality that can help to effectively reduce or eliminate depression in seniors.

Exercise also positively affects self-image. It adds balance to the older adult's

life and can bring about a sense of accomplishment and well-being, improved self-esteem, reduction in physical and emotional tensions, enjoyment and increased self-confidence (Birkel, 1998). Osness and Mulligan (1998) also found that increased levels of moderate but regular exercise behaviors resulted in greater feelings of well-being and improved self-image.

The beneficial effects of exercise on mood and cognition are well-documented in the literature. Birkel (1998) examined the effects of movement experiences, in the form of Mideastern dance and relaxation, on older adults' cognitive functioning. These activities were found to stimulate the brain and induce a "heightened state of arousal" which facilitated increased interaction of older adults with their environment. This type of exercise was also found to improve relaxation ability and the ability to concentrate. Following an extensive review of the literature, Golomb, Solidum and Warren (1997) reported that regular exercise has been found to significantly reduce stress and promote a more optimistic outlook among women with primary dysmenorrhea. Since regular exercise was demonstrated to provide benefits to women experiencing primary dysmenorrhea, it may also benefit perimenopausal women 55 and over who are also experiencing dysmenorrhea. Focht and Koltyn (1999) found decreases in anger and fatigue as compared to baseline values after moderate and high intensity acute bouts of resistance exercise in experienced and inexperienced adult weightlifters.

The benefits of exercise in relation to mental health can also indirectly have a positive effect on physiological parameters, such as blood pressure. Focht and Koltyn (1999) found that aerobic exercise reduced state anxiety that, in turn, is linked to

lowering of the systolic blood pressure. All of these beneficial effects of exercise on mental health can serve to improve the perception of quality of life in older adults (Powell, et al., 1998).

Exercise and Social Health

Effects of exercise on social health has not been well researched. Clark (1996) investigated the relationship between age, socioeconomic status and exercise self-efficacy in a group of inactive, low socioeconomic status, elderly black women. Subjects felt the exercise program was beneficial because they were “getting out”, increasing their social contacts and making new friends. Exercising in a group helped these subjects overcome many barriers via the verbal persuasion and support provided by others. Spirduso and Cronin (2001) also found that physical function was an important predictor of social support by predicting the number of face-to-face contacts and exposure to the number of instrumental support systems for older adults provided by social interaction. In another study by Conn (1998), it was found that a high physical activity score reaped the benefit of more social interaction, thereby positively influencing social health. Evans (1998) states that older people often join exercise programs because of the increased opportunity for socialization, not necessarily for the fitness benefits. This factor is something that can be capitalized on in setting up exercise programs for seniors.

Another benefit to social health resulting from participation in physical activities is the maintenance of independence (Hombergh, 1995). Due to a feeling of well-being produced from physical activities, older adults will more likely feel empowered to do

things for themselves, live as independently as possible, and interact socially with others. When exercising in a group, older adults will feel a part of a group and form relationships with others, enhancing perception of the social aspect of quality of life.

Self-rated health affects older people's life-satisfaction and self-perceptions (Adams, 1971). Increasing the vitality or slowing down the physical deterioration process can be one effective means of improving the self-perceptions of older adults (Tien-Hyatt, 1987). Exercise has the capability to accomplish this, as shown by the literature review.

In summary, the literature review revealed extensive research findings regarding the physical benefits of exercise for adults of all ages. The psychological benefits have been investigated to a lesser degree and only a small amount of research was identified that focused on the social benefits of exercise. Some of the studies focused on a younger population; however, many of the findings can be generalized to the over 55 age group because exercise has not been demonstrated to benefit only younger participants. Studies that focused on the older population were mostly concerned with how exercise might improve a particular condition, such as cardiovascular disease. Research has demonstrated that a regular exercise regimen is beneficial for older adults physically, mentally, and socially. A regular, moderate-level, low-impact exercise regimen has been found to be best tolerated by older adults. However, there is a lack of research investigating exercise preferences of older adults, the amount of exercise required to maintain the health of older adults, and possible motivating factors to promote healthy exercise behaviors in seniors. The present study will identify the

effects of various levels of exercise and age on older adults' perceptions of their physical, mental, and social health status as well as the exercises and activities a group of older adults prefer and practice.

CHAPTER 3

METHODOLOGY

This chapter presents the research design, sample population, facilities for data collection, instruments, and the research procedure and protocol. In addition, issues related to the subjects' risks and benefits are described.

Research Design

The relationship between level of exercise and self-perception of physical health, mental health, and social health in a group of older adults engaging in some type of physical activity was investigated using a nonexperimental method. A descriptive design was used to determine the relationships among the study variables. There were 5 variables considered in this study. Exercise level was one independent variable and it was divided into three impact levels: ADL activity only, low impact level, and high impact level. Age was the second independent variable. The three dependent variables included self-perceptions of physical health, self-perceptions of mental health, and self-perceptions of social health.

A between-subject group comparison was made of the self-perceptions of health between a group of older adults performing ADL activities only, a group of seniors

engaging in low impact exercise, and a group of older adults performing high impact exercise. A cross-sectional design was utilized to collect the data at one point in time.

Sample Population

The population of interest was older adults age 55 and older who were involved in various levels of physical activity. These activity levels included: (1) performing activities of daily living; (2) low impact activities such as leisure walking, gardening, or performing household chores; and (3) performance of high impact exercise such as swimming, tennis, or participation in a formal exercise program. The sample size was determined by the inclusion of 30 subjects per variable and 30 subjects per group, for a total of 210 subjects or more, as necessary to fulfill the specified quotas established for each strata.

Subjects were recruited using quota sampling, a form of nonprobability sampling. The independent variable of age was stratified to enhance the representativeness of the sample. The quota for each strata was as follows: 70 subjects 55-64 years of age, 70 subjects 65-74 years of age, and 70 subjects over 75 years of age. Subjects were invited by the investigator in person to participate in the study after the research plan had been described.

Criteria for inclusion in the sample included the following: 1) male or female over the age of 55, 2) alert and oriented, 3) understands and speaks English, and 4) able to communicate via an interpreter if unable to comprehend or speak English. Exclusion criteria for this sample included the existence of a state of quadraplegia or a delusional or confused state in which loss of touch with reality has occurred.

Sample Recruitment

Two hundred and twenty four subjects were recruited using quota sampling for the variable of age. Three age groups were sampled: 55-64 years ($n= 71$), 65-74 years ($n= 79$), and over 75 years ($n= 74$). Sampling continued until at least 70 subjects were obtained in each of the age groups. Female subjects comprised 61% of the sample ($n= 136$) and male subjects 39% of the sample ($n= 88$).

The majority of subjects (67%, $n= 150$) were personally invited by the researcher to participate in the study. Seventeen percent ($n= 38$) of these subjects were personal acquaintances of the researcher, relatives, or friends of other subjects, 25% ($n= 56$) were recruited at the Active Adult Day Care Center (AADCC), and 25% ($n= 56$) were recruited at a swim program or exercise program at a YMCA. The remaining subjects were recruited by the director of a walking program for seniors (13%, $n= 30$) at a mall in an upscale area of Los Angeles, by an active senior citizen involved in ballroom dancing and a senior activity group in Michigan (8%, $n= 17$), by an office manager of a computer company in Los Angeles (8%, $n= 17$), and by friends of an older adult residing in a trailer-park for seniors (4%, $n= 10$).

Facilities for Data Collection

The data were collected in the activity room of an adult day care center, and at a YMCA, church, and mall. Data were also collected from personal acquaintances of the researcher at a location of their choice. Those who preferred to complete the study instruments at home were provided a self-addressed, stamped envelope to return at their convenience. The researcher described and discussed the research plan with the

manager of each facility and obtained verbal permission to conduct the study.

Instrumentation

A thirteen item demographic questionnaire developed by the investigator was administered (Appendix A) to measure demographic factors such as age and sex, ADL performance, health information, and feelings regarding exercise. A Physical Activity Questionnaire for the Elderly developed by Voorrips, Ravelli, Dongelmans, Deurenberg, and Van Staven (1991) (Appendix B) was used measure activity levels in older adults. Ware's (1997) SF-36 Health Survey was used to measure the self-perceived physical health and mental health variables (Appendix C). Self-perceived social health was measured using the Texas Social Behavior Inventory (Heimreich & Stapp, 1974) (Appendix D). A summary of the instrument characteristics is included in Appendix E.

Physical Activity Questionnaire for the Elderly

The independent variable exercise level was measured using the Physical Activity Questionnaire for the Elderly developed by Voorrips, Ravelli, Dongelmans, Deurenberg, and Van Staven (1991) (Appendix B). This questionnaire is composed of 12 items that assess 3 areas of activity older adults engage in: household activities, sport activities, and leisure time activities. Ten of the items are concerned with the level of household activities and are scored using a 4 or 5 point Likert scale. The sport and leisure time activities section involves answering 4 questions concerning a sport and 4 questions related to leisure time activity: 1) name of the sport or leisure activity engaged in; 2) intensity (scored by using code provided); 3) hours per week (scored

with code); and 4) period of the year (scored with code). The score represents the sum of the household, sport, and leisure time activity scores. The formulas for determining the household score, the sport score, and the leisure time activity score are provided in Appendix B.

This questionnaire has been tested for reliability and validity and has been shown to provide a reliable and valid method to classify apparently healthy seniors into levels of physical activity. Test-retest reliability was evaluated over an interval of 20 days and resulted in a Spearman's rank correlation coefficient of 0.89. Validity was established by comparing the Activity Questionnaire with the 24 hour physical activity recall method and with the pedometer, which measures only movements in a vertical direction by the whole body. Both of these reference methods had a reference point of only 3 days, whereas the questionnaire refers to activities of the last year. Therefore, the comparison between the questionnaire and the two reference methods can only be used to signal a possible trend. However, the Spearman's correlation coefficient between the questionnaire and the reference methods was 0.78 and 0.72 for the physical activity recall and the pedometer, respectively, indicating a reasonable relative validity (Voorrips, Ravelli, Dongelmans, Deurenberg, & Van Staveren, 1991).

SF-36 Health Survey (SF-36HS)

The SF-36HS was used to measure the dependent variables of self-perception of physical and mental health in older adults (Appendix C). This survey was developed by Ware (1994) to determine how people feel about themselves, how well people are able to do their usual activities, and how they rate their own health. The results from

this survey were compared to the type and amount of exercise older adults engage in, to determine how exercise affected seniors' perceptions of their physical and mental health.

This 36 item survey provides a direct method for assessing older adults' perceptions of their health. The SF-36HS is composed of 8 health concept scales: Physical Functioning (PF), Role-Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role-Emotional (RE), and Mental Health (MH) (see Appendix D.) Each scale measures either a physical and/or mental component of health. To score each of the individual scales, the final item values are summed by adding the numbers circled by the respondent. A higher score indicates a better health state. Physical health is measured by the PF, RP, BP, and GH scales, which taken together comprise the Physical Component Scale (PCS). Mental health is measured with the VT, SF, RE, and MH scales, which together comprise the Mental Component Scale (MCS). The SF-36HS items are scored using a 3 to 6-point Likert scale. Seven "yes" and "no" items are also included in the survey, with "yes" scored as 1 point, and "no" scored as 2 points.. Table 2 presents a description of how to interpret Very High and Very Low scores on the PCS and MCS.

Reliability of the SF-36HS has been established. Estimates of score reliability for the SF-36 scales have been reported in 14 studies investigating various disease processes, social conditions, and random samplings of the populations in both the United States and the United Kingdom. All reliability estimates exceeded accepted standards for measures used in group comparisons. For each scale, the median of the

Table 2

Description of Very High and Very Low Physical Component Scale (PCS) and Mental Component Scale (MCS) in the SF-36 Health Survey

Scale	Very Low	Very High
PCS	Substantial limitations in self care, physical, social, and role activities; severe bodily pain; frequent tiredness; health rated “poor”	No physical limitations, disabilities, or decrements in well-being; high energy level; health rated “excellent”
MCS	Frequent psychological distress; substantial social and role disability due to emotional problems; health in general rated “poor”	Frequent positive affect; absence of psychological distress and limitations in usual social/role activities due to emotional problems; health rated “excellent”

reliability coefficients across studies equals or exceeds 0.80, with the exception of the Social Functioning Scale which is 0.76. Only the Physical Functioning scale consistently exceeded the 0.90 standard of reliability. Reliability of SF-36 scale scores has also been estimated using internal consistency methods for 24 subgroups of patients participating in the Medical Outcome Study by McHorney et al. (1993). These patients differed in sociodemographic characteristics, diagnosis, and disease severity. The coefficients ranged from 0.65 to 0.94 across the SF-36 HS scales and these subgroups. Minimum standards of reliability for purposes of group comparisons were satisfied in all 24 patient subgroups for all SF-36 scales. Minimum reliability standards required for comparisons of individual patients were most consistently met with the Physical Functioning scale across patient subgroups (Ware, et al., 1994). Reliability estimates for the sample are presented in Chapter 4.

Content validity was also established for the SF-36 Survey by use of empirical approaches, including factor analytic tests of construct validity, “criterion-based” approaches, and numerous correlational studies. Content analysis revealed that the SF-36 includes 8 of the health concepts most frequently represented in widely used health status measures. The SF-36 differs from most other measures in that it attempts to represent a wider range of levels for most of these concepts. The construct validity of the SF-36 was evaluated by Harman’s (1976) analytic method called Principal Components Analysis, in relation to a two-factor-physical-and-mental-model of health across populations. These physical and mental components (PCS & MCS), accounted for 81.5% of the reliable variance in SF-36 scales in the general U.S. population (Ware,

Kosinski, & Keller, 1994), and 82.4% in the Medical Outcome Study (MOS) (McHorney, Ware, Raczek, 1993).

The scales measuring physical health (PF, RP, BP, and GH) correlated strongly with the MOS ($r = .56-.90$). The scales measuring mental health (VT, SF, RE, and MH) had a moderate to strong correlation with the MOS ($r = .27-.92$). The physical and mental components also correlated strongly with related principal components of 12 subgroups of the general U.S. population, ($N=2,474$). Table 3 presents the range of correlations between the SF-36 scales and the rotated principle component of 12 subgroups of the general U.S. population, demonstrating consistency of the SF-36 items. Table 4 presents the range of correlations between SF-36 scales and the rotated principle components of 23 medical outcome study subgroups, demonstrating the consistency of the SF-36 tool. Table 5 presents the SF-36 scales' product-moment correlations and reliability coefficients for the general U.S. population and Table 6 presents the product-moment correlations and reliability coefficients for the SF-36 scales and the MOS, further demonstrating the consistency of the SF-36 Health Scale (Ware, Kosinski, & Keller, 1994).

Texas Social Behavior Inventory

The variable of self-perception social health was measured using the Texas Social Behavior Inventory (TSBI) (Appendix D), . The TSBI is a measure of social competency or self-esteem. Based on the results of factor and item analysis of responses from over 1,000 people, two short forms (A & B) with 16 items each were developed from the original 32-item long form. Forms A and B scores are highly

Table 3

Range of Correlations Between SF-36 Scales and Rotated Principal Components of 12 Subgroups of the General U.S. Population (N=2,474)

SF-36 Scales	PCS	MCS
Physical Functioning (PF)	.77-.88	.05-.30
Role Physical (RP)	.67-.82	.16-.43
Bodily Pain (BP)	.70-.84	.17-.46
General Health (GH)	.53-.76	.29-.69
Vitality (VT)	.31-.73	.44-.82
Social Functioning (SF)	.34-.62	.46-.73
Role Emotional (RE)	.06-.48	.57-.83
Mental Health (MH)	.11-.27	.84-.90

Ware, Kosinski, & Keller (1994)

Table 4

Range of Correlations Between SF-36 Scales and Rotated Principal

Components, 23 Medical Outcome Study (MOS) Subgroups (N=3,445)

SF-36 Scales	PCS	MCS
Physical Functioning	.83-.90	.01-.16
Role Physical	.69-.81	.20-.41
Bodily Pain	.65-.83	.12-.42
General Health	.56-.76	.17-.51
Vitality	.43-.79	.27-.66
Social Functioning	.30-.72	.37-.82
Role Emotional	.11-.38	.66-.88
Mental Health	.01-.34	.75-.92

Note. PCS indicates Physical Component Scale. MCS indicates Mental Component Scale. Ware, Kosinski, & Keller (1994).

Table 5

Product-Moment Correlations and Reliability Coefficients (in parentheses), SF-36

Scales for the General U.S. Population (N=2,474)

	PF	RP	BP	GH	VT	SF	RE	MH
PF	(.93)							
RP	.65	(.89)						
BP	.52	.61	(.90)					
GH	.55	.55	.56	(.81)				
VT	.44	.50	.52	.58	(.86)			
SF	.45	.52	.49	.47	.51	(.68)		
RE	.30	.42	.32	.35	.44	.53	(.82)	
MH	.28	.35	.39	.46	.63	.56	.54	(.84)

Note. PF= Physical Functioning; RP= Role Performance; BP= Bodily Pain;

GH= General Health; VT= Vitality; SF= Social Functioning; RE= Role Emotional;

MH= Mental Health. Ware, Kosinski, & Keller (1994).

Table 6

Product-Moment Correlations and Reliability Coefficients (in parenthesis), SF-36 Scales

for the MOS (N=3,445)

	PF	RP	BP	GH	VT	SF	RE	MH
PF	(.93)							
RP	.60	(.84)						
BP	.56	.62	(.82)					
GH	.53	.48	.50	(.78)				
VT	.49	.57	.50	.57	(.87)			
SF	.45	.52	.53	.47	.57	(.85)		
RE	.29	.48	.34	.37	.51	.55	(.83)	
MH	.20	.34	.38	.41	.58	.66	.60	(.90)

Note. PF= Physical Functioning; RP= Role Performance; BP= Bodily Pain;

GH= General Health; VT= Vitality; SF= Social Functioning; RE= Role Emotional;

MH= Mental Health. Ware, Kosinski, & Keller (1994).

correlated with scores for the original scale. The criteria for the two 16-item short forms were equivalence of part-whole correlations, equivalence of means between forms and between sexes, equivalence of score distributions, and parallel factor structures (Heimreich & Stapp, 1974). Form A was utilized in this study.

The inventory items are scored using a 5-point Likert scale. The choices range from “not at all characteristic of me”, to “very characteristic of me”. The lowest self-esteem response receives a score of 0, while the highest self-esteem response receives a score of 4. A total test score is calculated with a possible range of scores between 0 and 64. A higher score indicates higher social competence or social health.

Reliability for the TSBI was established based on a sample of 238 male and 262 female undergraduate students at the University of Texas at Austin (Heimreich & Stapp, 1974). Alpha coefficients were reported for Form A as 0.85 for men and 0.86 for women. Validity was established using factor analysis and part-whole correlations confirmed the similarity of Forms A and B. The TSBI has been correlated with the Personal Attributes Questionnaire. Factor analysis demonstrated only one factor produced by principal axis rotation, whereas an oblique rotation yielded four factors: confidence, dominance, social competence, and social withdrawal (male) or relations to authority figures (female). For the sample in this study, the alpha reliability coefficient was .7915.

Data Collection Procedures

The study was explained to the office managers and the directors of the walking club, YMCA classes, and AADCC, and to all at the potential respondents. Informed

consent was obtained from all subjects following a verbal explanation of the study by the researcher. A packet of instruments was given to each of the respondents. The majority of subjects (74%, $n= 165$) completed the instruments by themselves and mailed them to the researcher in the stamped, self-addressed envelope that was provided. The researcher administered the tools to the remaining 26% of the subjects (25.75%, $n= 56$ at the AADCC and .25%, $n= 3$ personal acquaintances of the researcher), and marked the answers that were selected by the subject. Approximately twenty (36%) AADCC respondents were unable to complete the questionnaires themselves due to physical problems, such as poor eyesight or tremors, and requested that the measuring tools be administered to them by the researcher. The remaining respondents at the AADCC and the 3 personal acquaintance respondents indicated that they would also prefer to have the researcher administer the tools.

The subjects in the Active Adult Day Care Center were mostly low-income, minority seniors of Hispanic, Oriental, and African American ethnicity. Only five of these subjects (9%) were Caucasian, lower-income, American seniors. The seniors at the Beverly Center Walking group resided in nearby upscale neighborhoods around Beverly Hills, California. The economic status of the remaining subjects is unknown, but based upon personal knowledge and observations of the researcher, they were either in the middle-income bracket or the lower-income bracket.

Pre-Data Collection Meeting

Older adults who expressed an interest in participating in this study were contacted and a data collection appointment was set up. Informed consent was obtained

during the data collection appointment. The prospective subjects read the consent form, then their rights as research participants and the procedure were explained to them. If the person agreed to participate, he/she signed the consent form.

Order of Administration of Measures

The subjects completed the demographic questionnaire and the Physical Activity Questionnaire for the Elderly first. The SF-36 Health Survey was administered next, followed by the Texas Social Behavior Inventory.

Data Collection and Recording

The data were collected at the designated site, one subject at a time. Informed consent took 5 minutes to obtain. A packet of measuring tools was given to each individual who agreed to participate. It was anticipated that it would take approximately 20-30 minutes to complete the questionnaires. This time frame was based on a pilot test of 4 subjects assessing the time necessary to complete the instruments. The total duration of participation in the study ranged from 25-35 minutes.

Data Processing and Analysis

Descriptive statistics were used to describe the sample population and the study variables. Pearson product moment correlation coefficients were calculated to determine the relationship between the study variables. Multivariate regression analysis was used to analyze the continuous data. In multivariate regression, several dependent variables are predicted from a set of predictors (Stevens, 2002). This procedure simultaneously models 2 or more continuous dependent variables that are themselves related. The dependent variables might be differentiated aspects of the same variable.

In this study the dependent variables were differentiated aspects of health: physical health, mental health, and social health. The independent variables of exercise level and age were used as predictor variables to determine the degree of change or the amount of variance in the dependent variables of self-perception of physical health, self-perception of mental health, and self-perception of social health, that could be attributed to each of the independent variables. The level of significance was set at $<.05$ in interpreting the inferential statistics used in the study. The SPSS program for Windows was used for data analysis.

Limitations of the Study

Three limitations of the study have been identified. The first involved the lack of random sampling. Quota sampling was utilized until each of the three age groups had at least 70 subjects. Older adults who happened to come into the facility where sampling was occurring were asked to participate in the study. Sampling error may be greater because a part or sample was used rather than the entire population of older adults. To help make the sample more representative of the target population and the findings more generalizable, quota sampling for age was used and a fairly large sample size was recruited ($N= 224$) (Polit & Hungler, 1997).

A second limitation of the present study also had to do with the recruited sample. A disproportionate number of females ($n= 136$) to males ($n= 88$) were recruited for the sample. Male subjects were not as readily available as were female subjects for the 75 and above age group. This is undoubtedly related to the greater longevity of women as compared to men. Since it is a well-known fact that males and

females perceive and respond to their world differently, the higher number of female subjects may have skewed the results towards the feminine view.

The third limitation is related to the method used for the administration of the measurement tools. The majority of the subjects (73%, $n=164$) completed the tools by themselves and mailed them back to the researcher. The measurement tools were administered by the researcher to the remaining 27% ($n=60$) of the subjects. Researcher bias is certainly a threat to the accuracy of the responses of the participants who were assisted by the researcher in completing the instruments. These subjects may have been influenced by the presence of the researcher and may have responded to the questions in a manner they felt was acceptable to the researcher or in a manner that made them look good.

Subject's Risks and Benefits

Potential risks. A potential risk was the experience of anxiety which could occur when completing any of the measurement tools or the demographic data questionnaire. Uncomfortable thoughts and feelings (such as negative perceptions) could have been aroused by the content of items present in the instruments. Mental or physical fatigue was also a potential risk due to the length of time required to complete the instruments. The respondents were instructed that if anxiety or mental or physical fatigue occurred, they were to notify the researcher and participation in the study would be terminated. None of these risks occurred during data collection and therefore did not present a problem.

Risk management. Risks were minimized by obtaining informed consent prior

to data collection. Each subject was informed of his/her right to withdraw from the study at any time without consequences. Anonymity was maintained by assigning subjects code numbers. The researcher kept all information confidential in a locked file cabinet. The researcher alone had access to the code numbers and the files. The files were destroyed when the analysis was completed.

Potential benefits. The physical, psychological and social benefits of exercise for older adults are well documented (Carroll et al., 1992; Nelson, 1998). Overall, exercise has been reported to offer the older adult a sense of control, a better outlook on life, a healthier feeling, improved relationships, and an increased desire to interact socially. Responding to the questions in each instrument could bring these unrecognized positive self-perceptions to mind and reinforce them which, in turn, can help promote a feeling of well-being in the participants. For example, an individual's positive evaluation of his/her personal appearance or social skills may awaken or renew the desire to initiate or maintain health-promoting behaviors, such as exercise. On the other hand, identification of negative self-perceptions related to items pertaining to perception of health and activity level may also serve as an impetus to begin an exercise regimen.

Risk/benefit ratio. The benefits of exercise for seniors was clearly evident in the literature review. Negative aspects of exercising were also identified, but benefits as reported certainly outweighed the risks. There was also a minimal risk of self-depreciation in identifying self-perceptions of health in seniors who exercise and those who do not. On the other hand, recognition of positive feelings resulting from exercise

could be beneficial to their perceptions of well-being.

Expense to subjects. No financial expense to the subject was anticipated. The elements of time and effort were the only potential cost to the participant.

CHAPTER 4

RESULTS

This chapter presents the study findings. A description of the sample population is provided along with the variables that may influence activity levels of the older adult participants. Statistical analysis to test each study hypothesis is then presented, along with supplemental data analysis using multivariate regression procedures to test the strength of the two predictor variables (exercise level and age) on the three criterion variables (self-perception of physical health, self-perception of mental health, and self-perception of social health).

Demographic Characteristics

Age Felt

Table 7 presents a comparison of actual chronological age with age felt for both men and women in the sample. The majority of subjects stated that they felt younger than their chronological age. The response to how much younger subject's felt ranged from a few years to several decades. Very few from each age category stated that they felt older than their chronological age. A greater percentage of men under 74 years of age felt younger than their chronological age as compared to women in the

Table 7

A Comparison of Chronological Age With Age Felt

Age Group	Total Number of Responses	Age Felt: younger	Age Felt: stated age	Age Felt: older	Sex (no. of cases)
55-64 years	62	28	7	1	Female (36)
55-64 years	62	22	2	2	Male (26)
65-74 years	72	36	8	1	Female (45)
65-74 years	72	23	4	0	Male (27)
75- and-up	64	35	6	4	Female (45)
75-and-up	64	13	3	3	Male (19)

Note. Numbers in columns (198) do not equal total number of responses (224) due to failure of some respondents to complete this item.

same age groups.

Marital Status/Number of children, Grandchildren, Great-Grandchildren

The majority of the subjects were married (45%, $n=101$), 16% ($n=36$) were divorced, 23% ($n=52$) were widows or widowers, 13% ($n=29$) were single, and 1% ($n=2$) were either separated or engaged. The majority of respondents (79%, $n=177$) had 1-6 children and 79% ($n=177$) stated they had between 1 to 38 grandchildren. Twenty-two percent ($n=49$) said they had between 1 to 11 great-grandchildren.

Smoking/Alcohol Habits

The majority of the seniors did not smoke (87%, $n=195$). The remaining 13% ($n=29$) stated they smoked regularly; some smoked less than 1 pack per day (8%, $n=18$) while a smaller number smoked 1 pack per day (3%, $n=7$). Less than 1% ($n=2$) smoked 2 packs per day and less than 1% ($n=2$) smoked more than 2 packs per day. The majority of subjects stated that they never drink alcohol (55%, $n=123$), 17% ($n=38$) stated they rarely drink alcohol, 19% ($n=43$) have a drink occasionally, and 9% ($n=20$) reported drinking alcohol frequently.

Feelings About Exercise

Subjects were asked whether or not exercise was something they liked to do. Seventy-five percent of the respondents ($n=168$) reported positive feelings about exercising, such as, "It's good for you," and "It's something I like to do." A negative view was expressed by 20% ($n=45$) of the subjects. Some of the negative feelings were stated as, "I don't like to exercise!" and "I don't like to exercise because I work too hard at my job." A small percentage (3%, $n=7$) held both a positive and negative view

about exercising. These subjects expressed sentiments such as, “I don’t like to exercise but I do it anyway because it’s good for you.”, and “I know I should do more, but I don’t like to do it, I guess I’m lazy.”

Present Medical Conditions

Various medical conditions can have a negative effect on exercise level. Approximately 86% of the population over age 65 reported having one or more chronic conditions (Steffl, 1984). Most of the subjects in this study (97%, $n= 217$) stated that they had at least one chronic medical condition. The remaining 3% ($n= 7$) did not complete this survey question. A second chronic condition was indicated by 59% ($n= 132$), while 35% ($n= 78$) indicated a third, and 14% ($n= 31$) listed a fourth condition. The four most frequently cited chronic medical conditions involved the cardiovascular system (69%, $n= 155$), musculoskeletal system (58%, $n= 130$), endocrine system (24%, $n= 43$), and neurosensory system (23.4%, $n= 52$).

Medications

Medications can have both a positive and negative effect on activity level. Older adults are often taking several medications at the same time that may have a negative cumulative effect on the desire to exercise and their physical ability to perform exercise activities. In the subject population, 85% ($n= 190$) stated they were currently taking at least one medication for a medical condition. A second medication was taken by 59% ($n= 132$) of the subject population, while 35% ($n= 78$) were taking a third, and 14% ($n= 31$) were taking a fourth medication. Some subjects indicated they weren’t taking medication (10.7%, $n= 24$) and 4% ($n= 9$) did not answer this question. The four

most frequent categories of medication taken were those affecting the circulatory system (77.8%, $n= 174$), neurosensory system (17.3%, $n= 39$), the musculoskeletal system (15.9%, $n= 36$), and over-the-counter nutritional supplements (59.7%, $n= 134$).

Employment

The majority of the sample reported not being currently employed (70.5%, $n= 158$). The remaining subjects (29.5%, $n= 66$) were presently employed in various occupations, ranging from education and health care to sales and secretarial work. Four-and-one half percent of these individuals ($n=3$) also held a second job ranging from a computer analyst or a managerial position to being a handyman or waitress. One percent ($n=2$) did not answer this question. The top four past occupations listed were jobs in sales, the health care field, education, and secretarial work.

Activities of Daily Living

Activities of daily living (ADL) include personal hygiene, dressing, toileting, eating, mobility, and performance of manual tasks, such as pouring a glass of water. Most of the subjects (93.8%, $n=210$) stated they can do all six of the ADLs independently. Five of the ADLs were performed without assistance by 2.7% ($n=6$) of the subjects, 0.4% ($n=1$) was able to do four, 2.7% ($n=6$) performed three independently, and 0.4% ($n=1$) could only perform two without assistance.

Summary of Demographics of Sample

The majority of the subjects felt younger than their chronological age and were able to perform their activities of daily living independently. Three-fourths of the sample reported having positive feelings concerning exercise and nearly a third were

still working outside of the home. Almost the entire sample reported having at least one chronic medical condition and were taking at least one medication. The majority demonstrated healthy choices in their decision not to smoke or drink alcohol and were independent regarding performance of ADLs.

Results of Hypothesis Testing

In this section the following are presented in relation to each study hypothesis:

(1) results of statistical procedures to test each hypotheses (Pearson r and multiple regression analysis) are presented; (2) was the hypothesis supported or not supported; and (3) discussion of hypothesis testing findings within the context of descriptive data concerning the variables included in the hypotheses.

Hypotheses 1: Exercise Level is Positively Related to Self-Perception of Physical Health in Older Adults

A relatively weak, but statistically significant positive correlation was found between level of exercise and the perception of physical health ($r = .239$, significance = $p < .05$, $r^2 = 5.7\%$). Almost 6% of the variance in self-perception of physical health in older adults was explained by exercise level. This hypothesis was supported by the data.

The physical activity (PA) scores had a wide range, from 0.35 to 84.68. Scores below 3.0 resulted from reporting of participation in household activities only (Appendix B). Fifty of the subjects (22%) had a score below 3. Any score above 3.0 indicated that the subject participated in some sport, leisure activity or both (78%, $n = 174$). The majority of the subjects (60%, $n = 134$) had a score somewhere between

3.1 and 25.0 and the PA mean for 224 participants was 14.0, indicating that the majority of respondents reported low impact exercise as a regular activity. The higher the score, the more sports and/or leisure activities the subject was involved in. A greater percentage of the fifty PA scores below 3 were reported by female participants (56%, $n=28$), as compared to male participants (44%, $n=22$), indicating that daily activities of females usually involve household chores while a greater percentage of males participate in sports and other leisure time activities. Figure 1 depicts the frequencies for the physical activity scores among the participants as a whole, while Figure 2 presents the distribution of physical activity scores for each gender. Table 8 presents the frequency of participation in various levels of physical activity. Low impact activity appears to be the activity level of choice for the majority of the participants.

Table 8

Frequency of physical activity scores in the three levels of exercise

Activity level Percent	Frequency	Percent	Cumulative
ADL only	34	15.2	15.2
Low Impact	115	51.3	66.5
High Impact	75	33.5	100.0
Total	224	100.0	

Measures of exercise level included the ability to perform activities of daily living and the responses to the Physical Activity Questionnaire for the elderly with regards to the amount of participation in household chores, leisure time activity, and sport activity.

Measures of physical health included the subscales from the SF-36 PCS: general

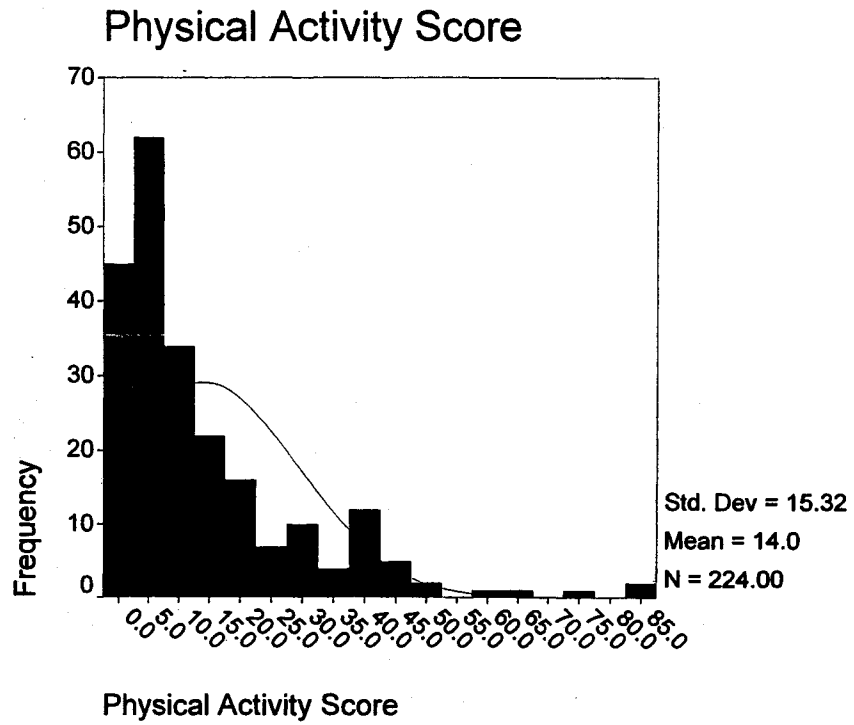


Figure 1. Frequency of physical activity scores

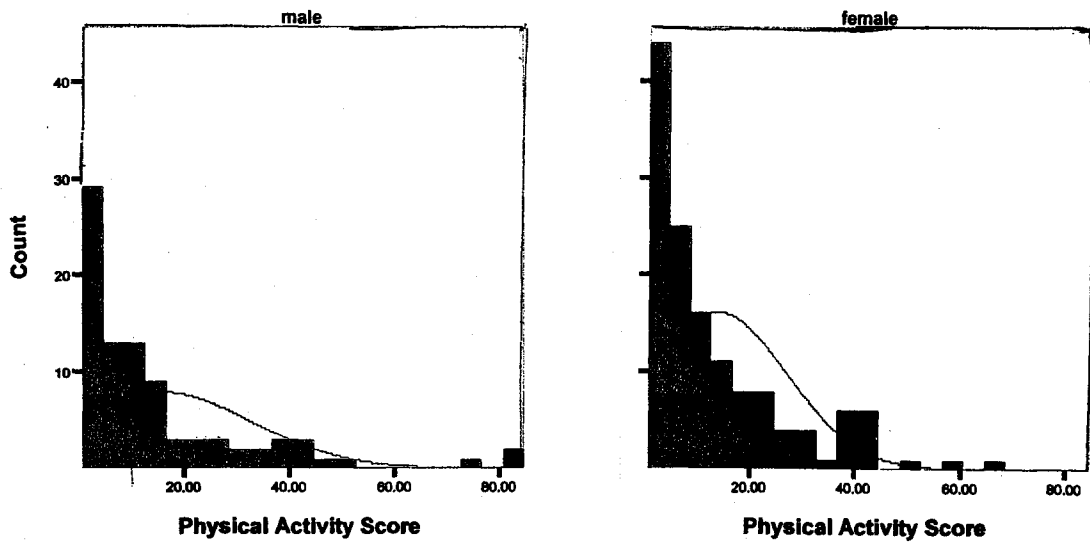


Figure 2. physical activity score distribution for males.

Physical activity score distribution for females

health, physical functioning, role physical, and bodily pain. The following are descriptive statistics results from each measure of exercise level and physical health subscale.

Activities of Daily Living and Physical Activity Questionnaire for the elderly.

As stated earlier, 210 of the 224 subjects indicated that they were capable of performing their ADL independently and almost every subject participated in some type of regular activity, either in the form of household chores, leisure time activities, or participation in a sport.

Participation in a sport was not as frequent as participation in leisure time activities. Only 25% ($n= 44$) of the 174 subjects who reported doing more than household chores participated in a sport while 90% ($n= 157$) reported participating in some form of leisure activity. Almost one-half of the participants walked for exercise. Some were in organized groups, such as the Silver Sneakers, and others walked in their home neighborhood. In addition to walking, the most frequent leisure time activities engaged in were participation in an exercise regimen (43%, $n= 68$) and gardening (13%, $n= 20$). The top three sport activities cited were golf (13%, $n= 6$), swimming (7%, $n= 3$) and bowling (4%, $n= 2$). Many participants were involved in one leisure time activity (34%, $n= 53$), some in more than one leisure time activity (38%, $n= 60$) and others were involved in both a sport and leisure time activities (19%, $n= 33$). Five subjects (3%) participated in sports alone and the remaining 50 participants (22%) were involved neither in sports or leisure time activities.

General health subscale. For this study sample, the alpha coefficient was

determined to be .770 for the general health subscale indicating that the reliability was adequate. Of the 83% ($n=186$) who rated their health positively, nearly 14% ($n=31$) claimed that they felt their health was excellent, 40.6% ($n=91$) said it was very good, and 28.6% ($n=64$) stated they were presently in good health. Of the 17% ($n=38$) who rated their health negatively, 14% ($n=31$) said it was fair and 3% ($n=7$) that it was poor. Many of the subjects felt that their health now was about the same as it was one year ago (61%, $n=137$), while 26% ($n=58$) felt their health was better than one year ago, and 13% ($n=29$) viewed their health as having deteriorated. The majority felt that they did not get sick easier than others (79.9%, $n=179$), that they were as healthy as anyone they knew (65.6%, $n=147$), that they did not expect their health to get worse (54.9%, $n=123$), and that they felt their health was excellent (66.6%, $n=149$).

Physical functioning subscale. For the study sample, the alpha coefficient was determined to be .920 for the physical functioning subscale indicating adequate reliability. Many subjects stated that they were limited to some degree in performing one or more of their various activities for a typical day. The majority of limitations (77.3%, $n=173$) were with vigorous activities such as running and lifting heavy objects, ranging from being a little limited (35.3%, $n=79$) to being a lot limited (42%, $n=94$). Limitations with relation to moderate activities such as vacuuming or golfing were less frequent (47.3%, $n=106$), with 16.5% ($n=37$) being limited a lot, 30.8% ($n=69$) being limited a little, and 51.8% ($n=116$) stating they were not limited at all.

Role physical subscale. For the study sample, the alpha coefficient was determined to be .891 for the role physical subscale indicating adequate reliability. The

majority of the subjects denied that their physical health caused problems with their work or other daily activities, indicating that they did not need to cut down on the amount of time spent on work or other activities (77.2%, $n=173$), that they accomplished what they wanted to (66.1%, $n=148$), that they had no limitations in the kind of work or other activities performed (70.5%, $n=158$), and that they did not have difficulty performing work or other activities (71.4%, $n=160$).

Bodily pain subscale. For the study sample, the alpha coefficient was determined to be .889 for the bodily pain subscale indicating adequate reliability. Bodily pain and its effects on the ability to perform normal work was assessed. Subjects were asked to indicate the amount of bodily pain they experienced in the past 4 weeks. Only 26.3% ($n= 60$) of the subjects reported that they had not experienced pain at all. The remaining subjects reported that they had experienced various degrees of pain, from very mild (25.4%, $n= 57$) to very severe (2.7%, $n= 6$), with very mild pain being the most frequently cited level. Mild pain and moderate pain were both reported by 19.6% ($n= 44$) of the participants and 6.3% ($n= 14$) complained of severe pain. Despite experiencing some degree of pain, 58% ($n= 130$) stated that pain had not interfered with their normal work in the past 4 weeks.

Hypothesis 2: Exercise Level is Positively Correlated to Self-Perception of Mental Health in Older Adults

This hypothesis was not supported by the findings ($r= .030$, significance= .655). Measures of mental health included the mental health subscale, the role emotional subscale and the vitality subscale in the SF-36 Health Survey.

Mental health subscale. For the study sample, the alpha coefficient was determined to be .748 for the mental health subscale indicating adequate reliability. Although no relationship was found between exercise level and the self-perception of mental health in the data analysis, the majority of participants at all exercise levels felt positively about their mental health. The majority reported that they were not nervous persons (74.6%, $n= 167$), that they were generally able to be cheered up when feeling down (90.2%, $n= 202$), and that overall they felt calm and peaceful (77.2%, $n= 173$). Most expressed that they were happy (77.2%, $n= 173$) and did not feel down-hearted and blue (75.0%, $n=168$).

Role emotional subscale. For the study sample, the alpha coefficient was determined to be .827 for the role emotional subscale indicating adequate reliability. The role-emotional scale asked if participants felt they had accomplished less than they would like and if they felt they didn't do work or other activities as carefully as usual as a result of any emotional problems. Seventy five percent ($n=168$) stated that they did not feel they accomplished less than they would like and 86% ($n=193$) stated that they did do work and other activities as carefully as usual. The majority (86%, $n=193$) also stated that they did not have to cut down on the amount of time spent on work due to emotional problems.

Vitality subscale. For the study sample, the alpha coefficient was determined to be .840 for the vitality subscale indicating adequate reliability. The vitality scale in the SF-36 Health Survey was used to measure another parameter of mental health. When asked about their vitality, the majority responded that they often they felt full of pep

(84%, $n= 188$) and 84% ($n= 188$) reported they had a lot of energy at various times. On the other hand, 75% ($n= 168$) reported that they felt worn out at some time and 88% ($n= 197$) stated that they experienced various degrees of tiredness.

Hypothesis 3: Exercise Level is Positively Related to Self-Perception of Social Health in Older Adults

For the study sample, the alpha coefficient was determined to be .792 for the TSBI tool indicating adequate reliability. This hypothesis was not supported by the data ($r= .022$, significance= .739). Table 9 depicts responses to items on the Texas Social Behavioral Inventory that measure the degree of social health. Overall, the responses indicate that the participants had positive self-perceptions of social health regardless of their exercise level, possibly due to the kinds of social support evidenced at the data collection locations.

Figure 3 displays a histogram of frequencies of the summed scores from the Texas Social Behavioral Inventory. Despite the fact that data analysis showed that exercise level does not affect social health, the majority of participants held a positive view of themselves socially and, as discussed previously, most were active either in household chores, leisure time activities, sports activities, or a combination of these. (See 'Activities of Daily Living and Physical Activity Questionnaire for the Elderly' section for participation percentages).

Hypothesis 4: Age is Negatively Related to Self-Perception of Physical Health in Older Adults

Hypothesis 4 was supported by the findings. A moderately strong, negative

correlation between age and self-perception of physical health was found that was statistically significant ($r = -.308$, $p < .05$). The older the age, the less positive were perceptions of physical health.

The 55-64 year old age group had a range of physical activity scores (PA) from .348 to 84.677 (mean=16.171). Participants in the 65-74 year old group had a range of PA scores from .400 to 51.804 (mean=13.635). The PA range was .523 to 74.293 (mean= 12.623) in the 75 year old and up group. These results demonstrate a small decrease in activity level as the participants age, that is congruent with the study hypothesis.

Hypothesis 5: Age is Negatively Related to Self-Perception of Mental Health in Older Adults

This hypothesis was not supported by the findings ($r = -.085$, $p = .204$). Older adult participants in the study generally held a positive view of their mental health status regardless of age. Refer to the section ‘Mental health, role emotional and vitality subscales’ for a description of responses depicting self-perception of mental health of the participants.

Hypothesis 6: Age is Negatively Related to Self-Perception of Social Health in Older Adults

This hypothesis was not supported by the data ($r = -.114$, $p = .090$). Refer to Table 9 for a depiction of the responses of the participants to items measuring social health on the TSBI. Table 10 displays the TBSI results by age.

The mean TBSI score for participants aged 65 and older was basically the same

Table 9

Means and Modes for the Texas Social Behavioral Inventory

Category	Mean	Mode
Not likely to speak until people speak to me	(1) not very characteristic	(0) not at all characteristic
Describe myself as self-confident	(3) fairly characteristic	(4) very much charac.
Confident of my appearance	(3) fairly characteristic	(4) very much charac.
I am a good mixer	(3) fairly characteristic	(4) very much charac.
In group, trouble thinking right thing to say	(1) not very characteristic	(0) not at all characteristic
In a group, I usually do what others want	(2) slightly characteristic	(2) slightly characteristic
When disagree with others, my opinion prevails	(2) slightly characteristic	(2) slightly characteristic
Describe myself as attempting to master situations	(3) fairly characteristic	(4) very much charac.
Other people look up to me	(3) fairly characteristic	(3) fairly characteristic
I enjoy social gatherings	(3) fairly characteristic	(4) very much charac.
I make a point of looking others in the eye	(3) fairly characteristic	(4) very much charac.
I cannot seem to get others to notice me	(1) not very characteristic	(0) not at all characteristic
I would rather not have responsibility for other people	(2) slightly characteristic	(0) not at all characteristic
I feel comfortable being approached by someone in authority	(3) fairly characteristic	(4) very much charac.
I would describe myself as indecisive	(1) not very characteristic	(0) not at all characteristic
I have no doubts about my social competence	(3) fairly characteristic	(4) very much charac.

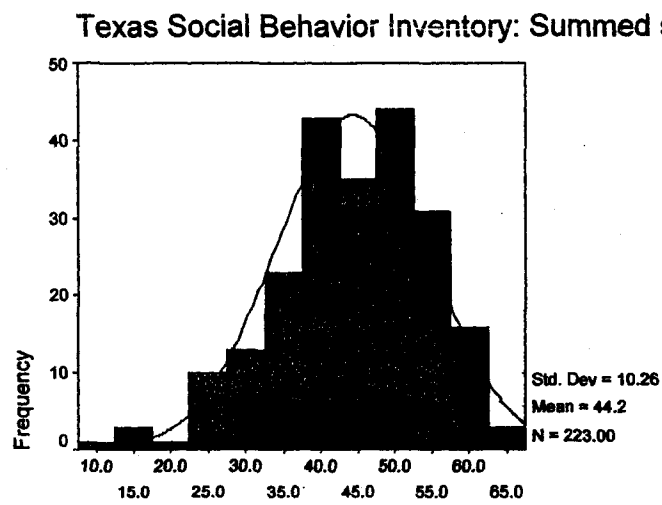


Figure 3. Texas Social Behavior Inventory: summed score mean substitution

as the mean TBSI score for the other two age groups. Out of a total of 64 points, the average score was 43 to 44. For participants 55-64 years of age, the mean was slightly (2 points) higher. Age does not appear to be a significant factor influencing how older

Table 10

TBSI Mean Score by Age Category

Age Category	Mean	N	Std. Deviation
55-64	45.98	70	9.59
65-74	43.12	80	9.28
75 and higher	43.75	73	11.71
Total	44.22	223	10.26

adults perceive their social health.

In summary, the following study hypotheses were supported: Hypothesis 1: exercise level is significantly correlated to self-perceived physical health in older adults; and Hypothesis 4: age is significantly related to self-perception of physical health in older adults. Hypothesis 2, 3, 5, and 6 concerning the relationship between exercise level and self-perceptions of mental and social health and between age and self-perceptions of mental and social health were not supported, and were rejected.

A moderate negative correlation exists between age and self-perception of physical health: as aged increased, perceptions of physical health decreased. A small positive correlation exists between exercise and positive self-perceptions of physical health. Age had a stronger correlation with self-perceived physical health than did exercise level. Exercise level and age were not significantly correlated with self-

perceived mental or social health. Table 11 provides a summary of the analysis of the hypotheses.

Table 11

Correlations: Health Perceptions with Physical Activity Score (PAS) and Age

Dependent Variable	Statistics	PA (Independent variable)	Age (Independent variable)
Physical Health	Pearson Correlation	.239*	-.308*
	Significance (2-tailed)	.000*	.000*
	Number of Subjects	223 Hypothesis 1	223 Hypothesis 4
Mental Health	Person Correlation	.030	-.085
	Significance (2-tailed)	.655	.204
	Number of Subjects	224 Hypothesis 2	224 Hypothesis 5
Social Health	Pearson Correlation	.022	-.114
	Significance (2-tailed)	.739	.090
	Number of Subjects	223 Hypothesis 3	223 Hypothesis 6

*Significant at $p < .05$

Additional Analysis

Multivariate Regression Analysis

Multivariate Regression Analysis is used to estimate the predictive value of a set of independent variables regarding several dependent variables. It is a method that evaluates the predictive value of one variable in relation to the value of the second variable. The dependent or criterion variables might be differentiated aspects of the same variable (Stevens, 2002). In the present study, the predictive variables were age and exercise level, and the criterion variables were self-perception of physical health, self-perception of mental health, and self-perception of social health. These criterion or

dependent variables are differentiated aspects of the same variable of health.

The results of the Multivariate Regression (MVR) analysis showed that age and exercise level were both predictors of self-perception of physical health. Age was found to predict 8.5% of the variance in self-perceived physical health while exercise level predicted 4.7% of the variance. Together these two variables accounted for 13.2% of the variance in self-perception of physical health.

Log transformation was used to promote normalcy by reducing the extent of kurtosis and skewness and to further isolate physical activity (exercise level) and age. Exercise level ($p = .001$) and age ($p = .000$) again were found to be significant predictors of self-perceived physical health. Greater variance in the dependent variable was accounted for with the transformed values: PA scores explained 7.5% of the variance in self-perceived physical health as compared to 4.7% when not transformed and similarly, age accounted for 9.7% of the variance in the criterion variable as compared to 8.5% when not transformed. Together the transformed age and exercise level scores accounted for 17.2% of the variance in self-perception of physical health. Table 12 and Table 13 display the results of the Multivariate Regression Analysis using log transformation and Table 14 demonstrates the between subjects effects using log transformation.

Although PA scores significantly predicted self-perception of physical health, they did so at a different beta weight than did age. The beta weight for PA scores was positive and demonstrates that the strongest relationship exists between self-perception of physical health and exercise level ($B = 2.810$). The positive relationship is

Table 12

Log Transformed Parameter Estimates

Dependent Variable	Parameter	B	Std. Error	t	p
Mental Health	PA Score	.380	.486	.782	.757
	Age	-.034	.028	-1.217	.217
Physical Health	PA Score	2.810	.681	4.127	.001*
	Age	-.180	.039	-4.646	.000*
Social Health: summed score mean substitution for person	PA Score	-.245	1.349	-.181	.856
	Age	-.129	.077	-1.683	.094

*Significant at $p < .05$

Table 13

MANOVA: Wilks' Lambda: Log transformed Physical Activity Score and Age

Effect	Value	F	Hypothesis df	Error df	Sig	Partial Eta Squared
PAS	.925	5.887	3.000	217.000	.001	.075
Age	.903	7.771	3.000	217.000	.000	.097

Table 14

Log Transformed Between-Subject Effects

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
PA Score	Physical Health	449.371	1	449.371	17.028	.000*	.072
	Mental Health	8.200	1	8.200	.611	.435	.003
	Social Health	3.406	1	3.406	.033	.856	.000
Age	Physical Health	569.572	1	569.572	21.583	.000*	.090
	Mental Health	19.870	1	19.870	1.482	.225	.007
	Social Health	293.311	1	293.311	2.831	.094	.013

*Significant at $p < .05$, 2-tailed

demonstrated by the fact that as the exercise level of participants increased, so did self-perceived physical health. Age also significantly ($p < .05$) predicted self-perception of physical health. An inverse relationship exists between age and self-perception of physical health ($B = -.178$). As participants' age increased, their physical health was viewed less positively.

Neither age nor PAS were found to be significant predictors of the other dependent variables. Self-perceived mental health was not significantly predicted by PA scores, which represents exercise level ($B = .005$, $p = .757$), or by age ($B = -.034$, $p = .217$). Self-perceived social health was also not significantly predicted by exercise level or PA score ($B = .004$, $p = .937$) and age ($B = -.127$, $p = .099$). However, the negative relationship found between age and mental health and age and social health was in the direction hypothesized.

In summary, nontransformed PA scores contributed 4.7% of the variance in

self-perception of physical health and age contributed 8.5% of the variance. The combined nontransformed scores of age and exercise level accounted for 13.2% of the variance in self-perception of physical health while the combined transformed scores of age and exercise level accounted for 17.2% of the variance. Although the percentage of variance accounted for by the predictor variables is small, the power of the effect is stronger due to the large sample size ($N=224$). However, PA score and age accounted for none or a minimal percentage of variation in the other two criterion variables, self-perception of mental health and self-perception of social health.

CHAPTER 5

SUMMARY, DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

In this chapter, the research design and method, data analysis, and the overall study results will be summarized. A discussion of the findings related to the hypotheses will be presented and implications for nursing practice, research, and education will be identified.

Summary of Research Design, Method and Results

The purpose of this descriptive study was to identify the relationship of age and exercise level with self-perception of physical, mental and social health. Expectancy theory and the concept of empowerment provided a theoretical foundation for this investigation. The following research hypotheses were investigated:

1. Exercise level is positively related to self-perception of physical health in older adults.
2. Exercise level is positively related to self-perception of mental health in older adults.
3. Exercise level is positively related to self-perception of social health in older adults.
4. Age is negatively related to self-perception of physical health in older adults.
5. Age is negatively related to self-perception of mental health in older adults.

6. Age is negatively related to self-perception of social health in older adults.

The data were collected over a 12 month period from older adults with whom the researcher was personally acquainted and from friends of the seniors whom the researcher knew. Other participants were recruited from exercise programs at a YMCA, the Silver Sneakers walking group, and an Active Adult Day Care Center. Descriptive statistics were used to describe the demographic data and to describe and compare study variables. Inferential statistics were employed to examine the relationship between the independent and dependent variables, to explore the predictor variables' power to influence the outcome of self-perception of health, and to examine between group effects of the variables.

An exploratory model was developed to depict these relationships. The model, based on study findings, proposes a positive relationship between exercise level and self-perception of physical health and a negative relation between age and self-perception of physical health. This model may prove useful in planning interventions for older clients and in developing future research.

Two of the six hypotheses were supported while 4 were not supported by the data. A regression analysis was performed on the variables in the exploratory model using the Multivariate Regression Analysis method. Results indicated that (1) exercise level had a significant, small, positive relationship with self-perception of physical health, (2) exercise level had no significant relationship with self-perception of mental health, (3) exercise level had no significant relationship with self-perception of social health, (4) age had a moderate, negative, significant relationship to self-perception of physical health, (5) age had no significant relationship with self-perception of mental health, and (6) age had no significant relationship with age and self-perception of social

health. Age and exercise level were found to simultaneously predict self-perception of physical health, with age accounting for more variance in the outcome variable.

Discussion

Participants

Participants in the study included 89 males and 135 females, totaling 224. The participants ranged from 55 years to 95 years old. Quota sampling for age resulted in a least 70 subjects in each of the three age divisions including young-old (55-64), middle-old (65-74), and old-old (75-and over), thereby promoting the generalizability of the findings.

The subject population was representative of the general population of older adults, therefore study findings can be generalized to the senior population as a whole in the United States. The ethnicity of the sample was fairly diverse with Caucasians representing a little over one-half and the remaining being either Hispanic, African-American, or Oriental. The majority of the participants were considered middle-class and approximately a fourth were low-income and a fourth were in the upper-income bracket.

Comparison of Findings With the Literature

Hypotheses Supported by the Literature

Hypotheses 1 and 4 were supported by the literature. With regard to Hypothesis 1, physical activity influenced the self-perception of physical health to a small degree. This finding supported the literature regarding factors influencing older adults' perception of physical health. Spirduso and Cronin (2001) studied physical

functioning and well-being in older adults and found that levels of physical functioning in older adults were related to feelings of well-being. A significant relationship between activity level and physical functioning was also found by Chen, Synder, and Krichbaum (2001) and Cooper, Bilbrew, Dubbert, Kerr, and Kirchner (2001).

Age was found to influence the perception of physical health in older adults to a moderate degree in Hypothesis 4. As persons age, they tend to view their physical health in a more negative light which supports current themes of age and physical health in the literature (Casperson & Merritt, 1995; Casperson, Mosterd, & Kroanbolt, 1998; Chen, Synder, and Kirchner, 2001). The participants in the present study did report various degrees of physical decline as they aged, but despite limitations and the fact that the data analysis revealed a significant negative relationship between age and perception of physical health, the participants still held to the perception that they were generally in good health.

Hypotheses Not Supported by the Literature

The findings of Hypothesis 2 was not supported by the literature. Mental health was not found to be influenced by level of physical activity in this investigation. This finding is not supported by the literature regarding factors influencing mental health. The literature purports that exercising may benefit mood in older adults, result in fewer anxiety and depressive symptoms, and result in greater feelings of self-efficacy (Cooper, et al. 2001; Spirduso & Cronin, 2001). Although the relationship between physical activity and the perception of mental health was not found to be significant, older adults tended to feel positive about their mental health.

The findings of Hypothesis 3 also differs from the literature. Study findings revealed that social health was not influenced by physical activity. The literature however, supports physical function as an important predictor of social support and social interaction (Spirduso & Cronin; Conn, 1998). Despite the level of exercise and the finding of a nonsignificant relationship between exercise level and self-perception of social health, the majority of the participants reported a positive view of their social functioning and social health.

Hypothesis Both Supported and Not Supported by the Literature

Present study findings of Hypothesis 5 demonstrated that age did not negatively influence perceptions of mental health; the majority of participants had a positive view of their mental health. This finding adds support to Terpstra's, et al. (1993) study who found that older adults felt mentally younger than their stated chronological age and none of the respondents felt mentally older than their chronological age. The findings seem to suggest that older adults who felt younger also felt healthier. On the other hand, the findings didn't support the work of Conn (1998) who found that age had a negative influence on outcome expectancy, self-efficacy beliefs, and therefore exercise behavior. Age may have a negative influence on self-confidence and health-promoting behaviors of older adults and ultimately their perception of mental health.

Study findings of Hypothesis 6 also both agreed and disagreed with the literature. Age was not found to affect older adults' self-perception of their social health. The majority of the subjects felt positively about their social health and were socially involved. This finding supports literature with regards to factors that influence

social health of seniors. It has been suggested that social health is an aspect of successful aging and that successful aging was due in part to a healthy perception of social health (Strawbridge, Wallhagen, & Cohen, 2002). On the other hand, age was reported by Cohen (2001) to negatively affect the social health of seniors. He describes the “shock of aging” as related in part to social losses: loss of life partners and friends through death, the loss of social status, and the loss of useful and respected roles in the family and culture. The findings of this researcher supports a negative relationship between age and social health.

Potential Causes for Refuted Hypotheses

Several reasons for the rejection of Hypotheses 2, 3, 4, and 5 are proposed. Social support may have played a major role in the positive evaluation of physical, mental, and social health in the majority of the participants. The location of recruitment of many of the participants promoted social interaction. Many activities that the older adults reported participating in, such as ballroom dancing, golf, and engagement in exercise classes also promoted social involvement and support. People are social animals and need the support of others at all ages. The need for social support was apparent in Cohen’s (2001) description of the “shock of aging” due in large measure to increased social losses: loss of partners, friends, social status, etc.

Although not assessed, religious beliefs and practices may also have influenced the positive evaluation of physical, mental, and social health in the majority of participants. For example, in the Christian faith, the Bible states that people are made in the image of God, their bodies are the temple of God, and that people should trust God

and rejoice in all things. According to the Christian faith, people are to give thanks continually for all their blessings. These Christian ideals suggest that believers would be more than likely to view themselves in a positive light (Scofield, 1988).

Another possible explanation for the positive evaluation of health reported by the majority of participants is that persons may inherently tend to view things positively. They may characteristically tend to take an optimistic view of themselves and their life situation. The fact that many of the participants were recruited at sites promoting healthy behaviors such as exercise classes, suggests that these participants like themselves enough to want to improve or maintain their health.

A fourth possible explanation for the predominance of positive evaluations is that it may be a conscious or unconscious effort on the part of the participant to deny the process of aging. By evaluating themselves positively, participants may be trying to convince themselves and others that they are not experiencing age-related changes and that they are winning the race with the clock. Positive responses may also be for the benefit of the researcher. Participants may have denied or suppressed their true feelings in order to say what they felt the researcher wanted or expected to hear in order to present a positive image of themselves.

In summary, four alternate explanations for the findings of the refuted hypotheses have been presented. The alternate explanations include social support, religious beliefs, inherent tendency to have a positive outlook, and an effort to deny the aging process. To assist older adults to achieve a satisfactory quality of life, it would be beneficial to identify additional factors that may be influencing older adults'

perceptions of themselves.

Ageist Assumptions Dispelled

It is apparent from data analysis that older adults participating in the study did not “buy into” the concept of ageism which is the basis of many age-related stereotypes discussed in the literature review. Many did not display the characteristics assigned to seniors by this prejudicial concept as evidenced by their responses to questions inquiring about self-perceptions of physical health, mental health, and social health. Table 15 demonstrates the ageist assumptions that were dispelled by responses to items in the measurement tools. Each response presented in Table 15 represents a majority of the participants. (Refer to Chapter 4 for a further description of items and for percentages and numbers of responses for items in each tool.)

The majority of the participants had a positive self-perception of their physical health, mental health, and social health, dispelling common ageist assumptions. In summary, health-promoting activities performed by participants demonstrated that they were not passive, they did not feel powerless to improve their condition, and they were able and willing to change to good health practices. Pain and limitations did not seem to cause obvious feelings of deterioration and decline in these participants. They adjusted their lifestyle to their physical capabilities. Even though the majority of participants stated that they felt tired at times, they frequently felt full of pep and energy thus demonstrating that these participants felt alive and generally have the energy to “get on with life”. The majority of participants also felt socially adept and stated that they enjoyed social gatherings “just to be with people”. These findings do not fit the

Table 15

Ageist Assumptions Dispelled by Responses to Items in the Measurement Tools

Tool	Ageist Assumption	Responses to Items
Demographic Questionnaire	Powerless, passive, sickly Unable/unwilling to change Withdrawn, isolated	Health-promoting behaviors Low incidence of age-related diseases Social interaction at site of recruitment
Physical Activity Questionnaire	Powerless, passive Unable/unwilling to change Frail, inactive	Health-promoting behavior: exercise Independent performance of ADLs Most active in some form
SF-36 Health Survey: PCS	Physical deterioration Unproductive Dependent	Positive view of physical health No limitation with daily activity 1/3 currently employed
SF-36 Health Survey: MCS	Depressed, anxious Miserable, lack energy Mental Deterioration	2% depressed or anxious, energetic Happy, calm, peaceful, not nervous Positive view of mental health
TSBI	Social deterioration	Self-confident in social abilities Good mixers, enjoy social gatherings

Note. TSBI= Texas Social Behavioral Inventory. PCS= Physical Component Scale.

MCS= Mental Component Scale.

picture that ageism paints of devalued, isolated, older adults with nothing left to live for.

Exploratory Model Proposed

Based on the findings from the data analysis, an exploratory model was developed to demonstrate the relationship between the study variables. In this study, exercise level was found to positively influence self-perception of physical health to a small degree but it did not influence self-perception of mental health or social health. Age was found to have a moderate inverse relationship with self-perception of physical health but it was not related to self-perception of mental or social health. Based on these findings, the following model was developed.

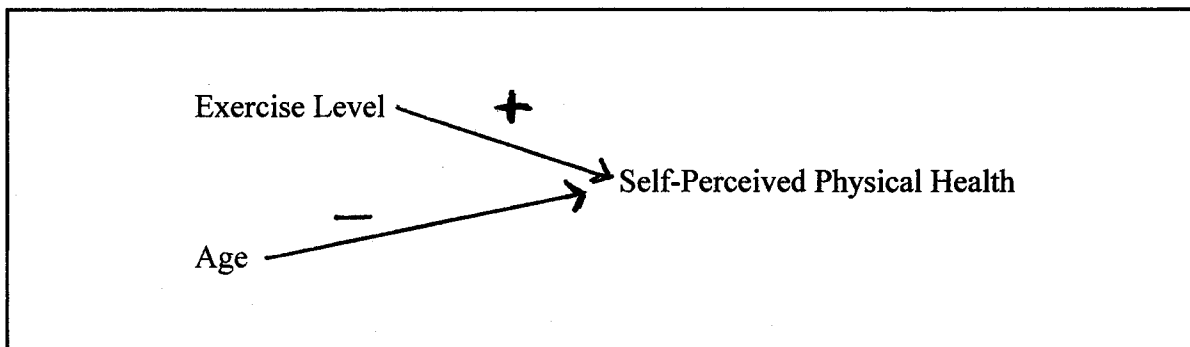


Figure 4. Study findings: relation between predictor variables, exercise level and age, and criterion variable self-perception of physical health.

Alternate Explanations for the Findings

Several alternate explanations for the findings are proposed. With regard to the dispelling of ageist assumptions by the participants and expression of positive ideals about the aging process, it is possible that their comments were a subconscious self-protective coping strategy. Butler (1980) and Zebrowitz and Montepare (2000) suggested that even if older persons suspect that a behavior was influenced by age, they

may not want to admit to themselves that they have encountered ageism. This is a result of the fact that the aging process has been defined in negative terms by society.

Palmore (2001) stated that a real incident of ageism may have occurred but is not reported because it was either not perceived as ageism, or because a person might not want to admit that he or she had experienced that form of ageism. This denial or dismissal of personal experiences with ageism may have been the conscious or unconscious attempt by some of the participants to preserve a positive self-concept.

Levy (2000) suggested that older individuals who are exposed to positive age stereotypes tend to show positive changes in memory performance, self-efficacy, handwriting, and in the will-to-live. Many of the older adults were recruited at sites where contact with other older adults was imminent. Seniors participating in the various exercise programs were most likely to be encouraged by their peers to continue on with this health-promoting behavior. The benefits of exercise have been well documented in the literature section. These benefits, in combination with the positive age-appropriate role models, may have influenced the positive outlook on the aging process expressed by many of the participants.

Another alternative explanation for the findings can be drawn from Palmore's (2001) survey on the perceptions of ageism. He proposed that self-hating elderly people may buy into the negative ageist stereotypes and promote staying middle-aged (or younger) forever. The majority of participants in the present study identified feeling younger by a few years to several decades. This feeling of being younger than the stated chronological age can be construed as an attempt to deny the aging process and

promote a positive self-image. Terpstra, Terpstra, Plawecki, and Streeter (1993) similarly suggested that older individuals may use denial of old age to insulate themselves from society's stereotypical attitude toward older adults and the negative stereotype of old age. They reported that maintaining a younger self-image is associated with a feeling of maintaining some control over one's life. Perceiving oneself as younger may be a denial of reality, but one that might be necessary for good psychological functioning. Responses of the participants may indeed have been influenced by these factors.

Researcher bias may also have been an influential factor in the responses provided by the participants. The instruments were administered by the researcher to 60 participants: all of the seniors from the Active Adult Day Care Center and several participants who were personal acquaintances. These participants may have been embarrassed or reluctant to provide such intimate feelings for fear the researcher would not view them favorably.

In summary, several conclusions can be drawn based on the findings of this study: (1) self-perception of physical health in older adults is explained only by a small degree by their physical activity level, (2) the age of older adults is a better predictor of perception of physical health than is physical activity level. (3) physical activity level and age are not predictors of either mental health or social health, (4) many older adults do not internalize ageist characteristics assigned to them by society, and (5) many seniors hold a positive view of aging.

Impact of the Study Findings

This study added to the knowledge base of nursing theory in the field of Gerontology by exploring areas that have been minimally investigated. Van Heuvelen, Kempen, Ormel, and Rispen (1998) found no research that focused on physical fitness (an aspect of physical health) as a function of age and physical activity within old age. The present study provided knowledge in these areas by investigating the relationship between age and self-perception of physical health and between level of exercise and self-perception of physical health and by assessing regular activities participants engaged in. In addition, the literature focused on actual, measurable, physiological changes in physical functioning to determine physical health in seniors and did not investigate the effect of self-perceptions of health on the actual health status of older adults. The present study focused on seniors' perceptions of their health, which did not always coincide with actual limitations identified. This discrepancy could become a motivating factor for compliance with health-promoting activity or exercise regimens.

Studies on leisure time activities conducted on older adults are rare (Strain, Carmen, Grabusic, Searle, & Dunn, 2002). Leisure time activities were evaluated in the present study when measuring the independent/predictor variable of exercise level. The frequency and type of leisure time activities older adults preferred and participated in were identified (see Demographic Section). The literature described exercising programs for older adults in relationship to studies examining various aspects of the exercise experience, such as injuries, effect on blood pressure, and benefits reaped (Carroll et al., 1992; Edward & Larson, 1992; Focht & Koltyn, 1999). The number of

participating seniors was unclear and the type of programs offered and preferred was also limited in the literature. The present study identified several types of exercise that older adults preferred (see Demographic Section). This is a beginning step to acquiring data concerning the preferred activities of seniors so that appropriate exercise regimens and activity programs can be developed and successfully implemented.

Minimal information on social functioning or the self-perception of social health in seniors was found in the literature. The present study investigated the relationship between exercise level and the self-perception of social health and the relationship between age and the self-perception of social health. Responses to questions regarding various aspects of social health add to the limited amount of information available on this topic. A glimpse into social activities preferred by the older participants was also provided which will help when planning activity interventions for seniors.

Implications for Nursing

Nursing Practice

The older population as a whole has consistently been viewed through a negative lens in our youth-oriented American society (Adams-Price, Henley, & Hale, 1998). Nurses are part of this modern society and are therefore exposed to the ageist attitudes upheld by society. Unconsciously, they may be relaying these feelings to their patients. Nurses must become aware of their attitude toward the aging so that they can identify their ageist attitudes, make an effort not to expose older clients to them, and render objective, individualized care to the older client, avoiding preferential behavior toward younger clients.

The participants in this study demonstrated a positive outlook about themselves, their life situation, and the aging process as a whole. This finding did not match the view held by society in general that older people are negative, demented oldsters who are miserable and depressed (Blanchette, 1996-1997; Friedman, 1993; Leach, 1999). This tendency to view themselves positively can be used as the basis for many interventions aimed at promoting quality of life in the older population. For example, this positive self-perception can be successfully used to motivate and encourage seniors to participate in health-promoting programs and activities that promote a sense of well-being.

Assisting older clients to maintain their optimal level of health is an important nursing responsibility and, as the study demonstrated, the majority of participants were willing and able to engage in health-promoting behaviors. Shephard (1997) suggests that with appropriate physical exercise, it is possible to resist the deleterious effects of aging. Nurses are in a position to be able to assess exercise behavior through careful history taking. Perceived barriers to exercise can be identified and viable options for overcoming them can be explored with the client. Opportunities for exercise can be identified and pursued where appropriate. This is a step towards promoting important health behavior changes imperative to maintaining an optimal level of health.

Many of the participants in the present study demonstrated health-promoting behaviors, such as not smoking or drinking alcohol. Around 17% participated in an formal exercise program of some sort and walking was cited by many as a regular leisure time activity. Nurses are in a position to build on this health-promoting

tendency by encouraging more older adults to engage in some form of regular exercise of their choice. The nurse should counsel the older adult that although some declines with age are inevitable, research indicates that physically active older adults maintain healthy functioning longer than do their sedentary peers (Nieman, 1995). Seniors who are health conscious are more likely to adhere to an individualized regular exercise regimen, assisting them to reach or maintain their optimal level of health.

Nursing Education

Nurses are not immune to the ageist ideals prevalent in American society today. Nursing care for older adults suffers when ageist attitudes play a major factor in nursing's inadequate response to the needs of the elderly (Estes, 1991; Lillard, 1982). Preparation of specialized geriatric nurses at the graduate level is also threatened by ageist attitudes of nurses. Haight, Christ and Dias (1994) stated that graduate programs in the United States that specialize in gerontological nursing are in crisis. In view of these factors, it is imperative that nursing educators depict older adults in a more realistic light to improve patient care and increase the desire to specialize in the field of gerontological nursing.

Findings of this study can be used in the education of nursing students to help dispel the ageist attitudes abounding in society. The older adults in the study dispelled many of the ageist characteristics ascribed to them by society and held an overall positive view of aging. Including positive aspects of the aging process in the education of nursing students will help to promote a more positive view of aging, reduce ageist assumptions, and hopefully improve individualized nursing care to older clients.

Nursing Research

The majority of research related to the health status of older adults has primarily focused on the perspective of physical health. Information on other aspects related to the health status of seniors is limited. Several areas have been identified as a result of the present study that warrant future investigation.

One such area is older adults' perception of what health is. No literature was found that addressed this topic which became of interest when older adults in the present study, who were obviously debilitated or limited in some fashion, rated their health as good. How do they conceptualize or define health? Being cognizant of how older individuals define health would be beneficial when planning interventions to encourage health-promoting behaviors. The nursing process could be used more effectively for detecting health needs, planning and implementing interventions to deal with the need, and evaluating their effectiveness.

Literature concerning the social health of seniors is very limited. Studies on how seniors perceive their social health are non-existent. It would be interesting to investigate the effect of perception of social health on the perception of physical health and the perception of mental health. In addition, identifying factors that influence the self-perception of social health in seniors would be beneficial for planning leisure time activities. The relationship between age and changes in leisure time participation warrants more in depth attention (Strain et al., 2002). Identifying age-related factors influencing the motivation to continue participating in usual leisure time activities would be invaluable for education and counseling interventions.

Exercise is imperative to maintaining good physical functioning. People are more likely to participate in activities that they like and are physically capable of doing. Limited studies are available that address older adults' exercising preferences. Future research should examine different forms of exercise for older adults and existent or perceived barriers to performing them. Attempts should be made as well to specify successful strategies for overcoming exercise barriers (Conn, 1998). Assisting older adults to overcome these barriers to exercise may enhance motivation to participate in this health-promoting behavior.

Finally, active older adults tend to be mentally and physically healthy. Mounting evidence demonstrates that physical activity is a key to preserving physical ability in old age (Sharpe et. al., 1997). No literature was found that examined factors that motivate older adults to become involved in various physical and social activities. Since activity has been found to play such an important role in maintaining health in the older population, future research should examine motivating strategies to help keep seniors active.

Conclusion

Although some of the findings were not what was expected, more information about older adults' self-perception of health as related to age and exercise level has been obtained and can be added to the knowledge base of gerontological nursing. It was expected, and found, that exercise level was positively related to self-perception of physical health in older adults and that age was negatively related. However, the findings that both exercise level and age were not at all related to self-perception of

mental and social health was not expected.

The literature supports the relationship found between both exercise level and self-perception of physical health and age and self-perception of physical health. The literature does not support the finding that there is no relationship between exercise level and self-perception of mental health. The literature showed that exercise made a positive contribution to mental health. The finding that exercise level and self-perception of social health were not related also was not supported by the literature. Literature showed that exercise and social health were positively related.

The finding that a relationship between age and self-perception of mental health and social health is nonexistent does not find support in the literature. Literature demonstrated that both a positive and a negative relationship existed between age and self-perception of mental health and age and self-perception of social health. Age did not seem to have a detrimental effect on either mental health or social health in some studies, while it did so in other investigations. More research on these relationships would prove beneficial to the planning of health-promoting interventions for the older population.

Several of the findings in this study relating to characteristics of older adults supported earlier literature. The following examples demonstrate similarities between the literature and present findings. The fact that older adults in the study generally held positive views of aging supported Celejewski and Dion's (1998) finding that older Americans often view the process of aging and their life circumstances positively. Hombergh, et. al. (1994) found that almost all elderly are in some way physically active,

with household chores often comprising a large portion of that activity. This was also found in the present study. Almost all of the participants were involved either in household chores, leisure time activities, and, to a lesser degree, sports. Finally, many studies reported that the vast majority of seniors felt considerably younger than their years (Adams-Price, Henley, & Hale, 1998). Except for a very few, participants in this study reported that they felt younger than their chronological age by a few years to decades.

Older adults are expected to comprise at least 20% of the American population in the near future (Heliker et. al., 1993). Due to this fact alone, more studies related to the well-being of seniors are imperative in order to assist older Americans to live life to the fullest. Information related to the well-being of older adults was provided by this study, but the present study is only a “chip in the iceberg” in achieving this goal.

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Appendix A: Demographic Questionnaire

Please answer the following to the best of your ability. Place your answers on the lines provided.

1. Age _____ 2. How old do you feel? _____ 3. Sex _____

4. Marital status _____ 5. Number of children _____ & grandchildren _____

6. Do you smoke? If yes, how many packs per day? _____

7. Do you drink alcohol? If yes how often? _____

8. Are you presently employed? If so, what type of work do you do? _____

9. What was your occupation in the past? _____

10. Present medical conditions? _____

11. How do you feel about exercising? Is it something you like to do? _____

12. Medications presently taking _____

13. Circle the activity of daily living that you are able to do independently:
personal hygiene dressing toileting eating
moving around (wheelchair, walking) manual tasks (ie. pouring glass of water)

Appendix B: Physical Activity Questionnaire for the Elderly

HOUSEHOLD ACTIVITIES

1. Do you do the light household work? (Dusting, washing dishes, repairing clothes, etc.)?
 0. Never (<once a month)
 1. Sometimes (only when partner or help is not available)
 2. Mostly (sometimes assisted by partner or help)
 3. Always (alone or together with partner)

2. Do you do the heavy housework? (Washing floors and windows, carrying trash disposal bags, etc.)?
 0. Never (<once a month)
 1. Sometimes (only when partner or help is not available)
 2. Mostly (sometimes assisted by partner or help)
 3. Always (alone or together with partner)

3. For how many persons do you keep house? (Including yourself; fill in "0" if you answered "never" in question 1 and question 2). _____

4. How many rooms do you keep clean, including kitchen, bedroom, garage, cellar, bathroom, ceiling, etc.? (Fill in "0" if you answered "never" in question 1 and 2).
 0. Never do housekeeping
 1. 1-6 rooms
 2. 7-9 rooms
 3. 10 or more rooms

5. If any rooms, how many floors? (Fill in "0" if you answered "never" in question 4.)__

6. Do you prepare warm meals yourself, or do you assist in preparing?
 0. Never
 1. Sometimes (once or twice a week)
 2. Mostly (3-5 times a week)
 3. Always (more than 5 times a week)

7. How many flights of stairs do you walk up per day? (One flight of stairs is 10 steps.)
 0. I never walk stairs
 1. 1-5
 2. 6-10
 3. More than 10

8. If you go somewhere in your hometown, what kind of transportation do you use?
0. I never go out
 1. Car
 2. Public transportation
 3. Bicycle
 4. Walking
9. How often do you go out for shopping?
0. never or less than once a week
 1. Once a week
 2. Twice to four times a week
 3. Every day
10. If you go out for shopping, what kind of transportation do you use?
0. I never go out for shopping
 1. Car
 2. Public transportation
 3. Bicycle
 4. Walking

SPORTS ACTIVITIES

Do you play a sport?

Sport 1: name _____
 intensity (code) _____ (1a)
 hours per week (code) _____ (1b)
 period of the year (code) _____ (1c)

Sport 2: name _____
 intensit (code) _____ (1a)
 hours per week (code) _____ (1b)
 period of the year (code) _____ (1c)

LEISURE TIME ACTIVITIES

Do you have other physical active activities?

Activity 1: name _____
 intensity (code) _____ (1a)
 hours per week (code) _____ (1b)
 period of the year (code) _____ (1c)

Activity 3: name _____
 intensity (code) _____ (1a)
 hours per week (code) _____ (1b)
 period of the year (code) _____ (1c)

Activity 2: name _____
 intensity (code) _____ (1a)
 hours per week (code) _____ (1b)
 period of the year (code) _____ (1c)

Activity 4: name _____
 intensity (code) _____ (1a)
 hours per week (code) _____ (1b)
 period of the year (code) _____ (1c)

Scoring of the Activity Scale for the Elderly

Household score: $(Q1 + Q2 + \dots + Q10/10)$

Sport score: $(ia \times ib \times ic)$ divided by the number of sports, 1 or 2 ($i=1$)

Leisure time activity score: $(ja \times jb \times jc)$ divided by the number of sports, 1-6 ($j=1$)

Codes

Intensity code:

0: lying, unloaded	code 0.028
1: sitting, unloaded	code 0.146
2: sitting, movements of hand or arm	code 0.297
3: sitting, body movements	code 0.703
4: standing, unloaded	code 0.174
5: standing, movements of hand or arm	code 0.307
6: standing, body movements, walking	code 0.890
7: walking, movements of arms or hands	code 1.368
8: walking, body movements, cycling, swimming	code 1.890

Hours per week:

1. less than 1.1 hour per week	code 0.5
2. 1.2-2.2 hours per week	code 1.5
3. 2.3-3.3 hours per week	code 2.5
4. 3.4-4.4 hours per week	code 3.5
5. 4.5-5.5 hours per week	code 4.5
6. 5.6-6.6 hours per week	code 5.5
7. 6.7-7.7 hours per week	code 6.5
8. 7.8-8.0 hours per week	code 7.5
9. more than 8.0 hours per week	code 8.5

Months per year:

1: less than 1 month per year	code 0.04
2: 1-3 months per year	code 0.17
3: 4-6 months per year	code 0.42
4: 7-9 months per year	code 0.67
5: more than 9 months per year	code 0.92

Appendix C: SF-36 Health Survey

Instructions: This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Answer every question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

1. In general, would you say your health is:

(circle

one)

- | | |
|----------------|---|
| Excellent..... | 1 |
| Very good..... | 2 |
| Good..... | 3 |
| Fair..... | 4 |
| Poor..... | 5 |

2. Compared to one year ago, how would you rate your health in general now?

(Circle one)

- | | |
|--|---|
| Much better now than one year ago..... | 1 |
| Somewhat better now than one year ago..... | 2 |
| About the same as one year ago..... | 3 |
| Somewhat worse now than one year ago..... | 4 |
| Much worse now than one year ago..... | 5 |

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

(circle one number on each line)

Activities	Yes, Limited A Lot	Yes Limited A Little	No, Not Limited At All
a. Vigorous activities , such as running, lifting heavy objects, participating in strenuous sports	1	2	3
b. Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
c. Lifting or carrying groceries	1	2	3
d. Climbing several flights of stairs	1	2	3
e. Climbing one flight of stairs	1	2	3
f. Bending, kneeling, or stooping	1	2	3
g. Walking more than a mile	1	2	3
h. Walking several blocks	1	2	3
i. Walking one block	1	2	3
j. Bathing or dressing yourself	1	2	3

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

(circle one number on each line)

	Yes	No
a. Cut down on the amount of time you spend on work or other activities	1	2
b. Accomplished less than you would like	1	2
c. Were limited in the kind of work or other activities	1	2
d. Had difficulty performing the work or other activities (ie. it took extra effort)	1	2

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

(circle one number on each line)

	Yes	No
a. Cut down the amount of time you spent on work or other activities	1	2
b. Accomplished less than you would like	1	2
c. Didn't do work or other activities as carefully as usual	1	2

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

(circle one)

- Not at all.....1
- Slightly.....2
- Moderately.....3
- Quite a bit.....4
- Extremely.....5

7. How much bodily pain have you had during the past 4 weeks?

(circle one)

- None.....1
- Very mild.....2
- Mild.....3
- Moderate.....4
- Severe.....5
- Very Severe.....6

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

(circle one)

Not at all.....1
 A little bit.....2
 Moderately.....3
 Quite a bit.....4
 Extremely.....5

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks-

(circle one number on each line)

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
a. Did you feel full of pep?	1	2	3	4	5	6
b. Have you been a very nervous person?	1	2	3	4	5	6
c. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
d. Have you felt calm and peaceful?	1	2	3	4	5	6
e. Did you have a lot of energy?	1	2	3	4	5	6
f. Have you felt downhearted and blue?	1	2	3	4	5	6
g. Did you feel worn out?	1	2	3	4	5	6
h. Have you been a happy person?	1	2	3	4	5	6
i. Did you feel tired?	1	2	3	4	5	6

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

(circle one)

- All of the time.....1
 Most of the time.....2
 Some of the time.....3
 A little of the time.....4
 None of the time.....5

11. How TRUE or FALSE is each of the following statements about you?

(circle one number on each line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people	1	2	3	4	5
b. I am as healthy as anybody I know	1	2	3	4	5
c. I expect my health to get worse	1	2	3	4	5
d. My health is excellent	1	2	3	4	5

Used with permission of Dr. Ware, 2000.

Appendix D: Texas Social Behavior Inventory (Form A)

Instructions: Choose the answer that best describes you by circling the appropriate letter. Please do not leave blank spaces.

Key: A- not at all characteristic of me
 B- Not very characteristic of me
 C- Slightly characteristic of me
 D- Fairly characteristic of me
 E- very much characteristic of me

1. I am not likely to speak to people until they speak to me. A B C D E
2. I would describe myself as self-confident. A B C D E
3. I feel confident of my appearance. A B C D E
4. I am a good mixer. A B C D E
5. When in a group of people, I have trouble thinking of the right thing to say. A B C D E
6. When in a group of people, I usually do what the others want rather than make suggestions. A B C D E
7. When I'm in disagreement with other people, my opinion usually prevails. A B C D E
8. I would describe myself as one who attempts to master situations. A B C D E
9. Other people look up to me. A B C D E
10. I enjoy social gatherings just to be with people. A B C D E
11. I make a point of looking other people in the eye. A B C D E
12. I cannot seem to get others to notice me. A B C D E
13. I would rather not have very much responsibility for other people. A B C D E
14. I feel comfortable being approached by someone in a position of authority. A B C D E
15. I would describe myself as indecisive. A B C D E
16. I have no doubts about my social competence. A B C D E

Appendix E: Instrument Description

Title	A Physical Activity Questionnaire for the Elderly	SF-36 Health Survey	Texas Social Behavior Inventory
Reference	Voorrips, Ravelli, Dongelmans, Deurenberg, & Van Staveren (1990)	Ware (1993)	Helmreich & Stapp (1974)
Number of Items	12	36	16
Description of Measure	Assesses level of household activities, sporting activities, & physically active leisure time activities	Assesses self-perception of physical and mental health. 8 health concept scales: 1. Physical Functioning 2. Role-Physical 3. Bodily Pain 4. General Health 5. Vitality 6. Social Functioning 7. Role-Emotional 8. Mental Health	Assesses social Competence.
7 Subscales			
Scaling	#1-10 Likert scale 11 & 12 fill in the blank	Likert Scale Forced choice: yes/no	Likert scale
Scoring	10 household activities: score from 0-5 Sport-score: (1a x 1b x 1c) 3 Leisure time activity score: (1a x 1b x 1c) 3 Questionnaire score: household score + sport score + leisure time activity score	*29 items with possible score of 1-3 up to 1-6 *7 yes/no items: "yes"= 1, "no"= 2 *Score each scale by summing final item values that have been chosen *Higher score indicates a better health state	*Items scored from 0-4. *Lower self-esteem responses= 0 *Higher self-esteem responses=4

E2

Validity	Spearman's Coefficient: 0.78 & 0.72	*For each scale, median Reliability Coefficients= or >0.80 *Internal consistency methods produced coefficients of 0.65-0.94	Correlation Coefficients: 0.81 & 0.83 with masculi- nity subscale for men & women; 0.42 & 0.44 with femininity subscale for men & women
Reliability	Test-Retest Spearman's Rank Coefficient: 0.89	*Content Validity established *Construct Validity 0.82	Alpha Coefficient: 0.85 for men; 0.86 for women

Appendix F: Consent Form

Barbara Leach is conducting an investigation examining the relationship between exercise and the self-perception of physical health, mental health, and social health in older adults. Since I have agreed to participate in this study, I understand that I will be completing 4 questionnaires: a Demographic Data Questionnaire, a Physical Activity Questionnaire for the Elderly, the SF-36 Health Survey, and the Texas Social Behavioral Inventory.

The data collection will take approximately 50 minutes. Participation in the study should not involve any added risks or discomfort to me except for possible anxiety that may result from the items in the questionnaires. Possible benefits from my participating in this study include improvement in the perception of the quality of life and self image and possible motivation to become active or more involved in a regular exercise regimen.

My participation in this study is entirely voluntary. I understand I may refuse to participate or withdraw at any time without suffering any consequences.

I understand my research records will be kept completely confidential. My identity will not be disclosed without consent required by law. I further understand that to preserve my anonymity, only group data will be used in any publication of the results of this study.

Barbara Leach has explained this study to me and answered my questions. If I have other questions or research-related problems, I can reach Barbara Leach at (626)-913-7410.

There are no further agreements, written or verbal, related to this study beyond that expressed on this consent form. I have received a copy of this consent document and "The Experimental Subject's Bill of Rights".

I, the undersigned, understand the above explanation and, on that basis, I give consent to my voluntary participation in this research.

Signature of Subject

Date

Signature of Witness

Date

Signature of Researcher

Date