



The effect of a regular exercise program on selected aspects of mental health and on the performance of daily tasks in a group of female senior citizens
by Amanda Carolyn Cater

A thesis submitted in partial fulfillment of the requirement for the degree of Master of Science in Physical Education
Montana State University
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Abstract:

The purpose of this study was to determine the effect of a regular exercise program on selected aspects of mental health and on the performance of daily tasks of a group of senior citizens. The aspects of mental health examined were self-concept and general well-being. Self-concept in this study was composed of measures of self-esteem, self-image, and body image. Seventeen women ranging in age from 66-83 years participated in the study.

There were two phases in the study. A one-month socialization phase consisted of group discussions in which the emphasis was on getting acquainted. The second phase consisted of a ten-month exercise program. Participants volunteered for the socialization phase or the exercise phase or both.

Five instruments were used before and after each program to assess changes in the participants. The instruments used to assess changes in self-concept were Rosenberg's "Scale of Self-esteem" (1965), McPherson's "The Real Me" (1966), and Kenyon's "Attitudes Toward Physical Activity" (1968), the body image section only. Two instruments designed by the author for this study were used to determine changes in general well-being and the performance of daily tasks.

After the socialization phase, scores in body image improved, and there was less discrepancy between real and ideal body image scores. After the exercise program, scores improved in self-image, real body image, well-being, and daily task performance for the majority of the participants. Neither program had a positive effect on the scores of self-esteem. It should be noted that the changes in test scores did not reflect the positive verbal comments made by the participants at the end of the program.

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by

AMANDA CAROLYN CATER

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ABSTRACT

The purpose of this study was to determine the effect of a regular exercise program on selected aspects of mental health and on the performance of daily tasks of a group of senior citizens. The aspects of mental health examined were self-concept and general well-being. Self-concept in this study was composed of measures of self-esteem, self-image, and body image. Seventeen women ranging in age from 66-83 years participated in the study.

There were two phases in the study. A one-month socialization phase consisted of group discussions in which the emphasis was on getting acquainted. The second phase consisted of a ten-month exercise program. Participants volunteered for the socialization phase or the exercise phase or both.

Five instruments were used before and after each program to assess changes in the participants. The instruments used to assess changes in self-concept were Rosenberg's "Scale of Self-esteem" (1965), McPherson's "The Real Me" (1966), and Kenyon's "Attitudes Toward Physical Activity" (1968), the body image section only. Two instruments designed by the author for this study were used to determine changes in general well-being and the performance of daily tasks.

After the socialization phase, scores in body image improved, and there was less discrepancy between real and ideal body image scores. After the exercise program, scores improved in self-image, real body image, well-being, and daily task performance for the majority of the participants. Neither program had a positive effect on the scores of self-esteem. It should be noted that the changes in test scores did not reflect the positive verbal comments made by the participants at the end of the program.

CHAPTER 1

INTRODUCTION

At the turn of the century, a small percentage of the United States population was over the age of 65. It is estimated that by the end of the 20th century, almost 19 percent of our population will be senior citizens (1980 census, U.S. Department of Agriculture). The growing number of older adults presents our society, and particularly the health care agencies, with some unique problems.

Men and women over 65 years of age are responsible for one-third of the nation's overall health costs and one-third of the family physician's total practice time. Older adults spend twice the number of days in the hospital and account for 3.5 times the health care costs of other age groups (Goodstein, 1981). With rising costs and increasing numbers of claimants, it is estimated that by 1991, Medicare will not have adequate funds to meet the demands of the aging population. A major dilemma for healthcare providers is how to provide quality health care at minimal cost and how to promote effective health care programs for the rapidly-increasing group of senior citizens. As health care costs increase, the expense of caring for our elderly becomes troublesome for individuals, families, and society.

As a preventive health measure and to improve the quality of life, many older adults are adopting a more active lifestyle. Senior citizens have joined the rising number of joggers, swimmers, and cyclists in

America's current fitness movement. Active older adults report feeling better and having increased stamina as a result of this change in lifestyle.

Researchers have been interested in the physiological effects of exercise on the older adult. Degenerative aspects of aging, such as poor circulation, stiff joints, and lack of energy, can be retarded by regular exercise (Smith, 1978; deVries, 1979). Work capacity can be increased in people aged 65-70 years by a conditioning program (Barry, 1966). Older participants in some studies have reported that in addition to the physiological gains, they also have experienced psychological improvements evidenced by better moods, a better appetite, more vitality, and a general feeling of well-being (Morgan, 1979). These improvements imply that a relationship may exist between participation in conditioning programs and certain aspects of mental health.

Overall health is related both to physical and mental condition and is reflected in the ability to cope with day-to-day living. The quality of life for many elderly individuals depends somewhat on their maintaining the ability to take care of their homes and themselves. Often decreased physical stamina or mental depression, or both, reduce the capacity to keep house and carry out shopping duties. Investigators have suggested that the day-to-day functioning of an elderly person is partially related to mental health (Lawton, 1975; Wolinsky, 1984). For some older people, exercise programs may be a form of insurance against the long-term institutional care currently required by five percent of our senior citizens.

A review of the literature raised questions in the mind of the investigator about the relationships among exercise, mental health and the process of aging. If senior citizens were more active, would they be better able to take care of themselves? Would the tasks of daily living be easier to accomplish? Would they feel better about their bodies? If they had more vitality as a result of exercise, would they be happier? Would they be less lonely or bored? Can an intervention such as an exercise program make a difference in self-esteem? This study was designed to investigate these types of questions and to provide some baseline information about the use of exercise programs as a preventive health measure with older adults.

The Theoretical Framework

Studies have indicated that the quality of life for the elderly depends on many factors such as health, dwelling place and financial security. Health is a major concern of the individual, and for agencies providing health care services. A person's health is composed of physical, mental, emotional and spiritual aspects, all of which are inter-related. Gerontologists have been interested in the relationships among biological, physiological, and psychological aspects of aging (Smith, 1978; Schaie, 1981; Poon, 1980). Psychologists have studied components of life satisfaction, morale, and self-concept in the elderly. Researchers in physical health have investigated the effects of exercise programs and nutritional modifications on the aging body.

Some of the previous research has been useful in designing programs to provide help to aging individuals and to improve the quality of their life. However, much of the research has focused on the physical aspects of health, and the effect of conditioning programs on the aging process; very little research has been directed toward examining the effects of interventions upon the improvement of the mental health and independence of older adults. Would an exercise program lead to a more active lifestyle? Would an active lifestyle help maintain the independence sought after by older adults? Since exercise and physical health are directly related, (Smith and Serfass, 1981) and since there is some evidence to support the theory that physical and mental health are related, (Birren, 1964) would an exercise program significantly affect the mental health of a group of older women? This study was designed in an attempt to provide some clarification of these questions and to provide information which may be useful in the field of health care services.

Statement of the Problem

The major aim of the study was to investigate the effects of a regular exercise program on the mental health and performance of daily tasks of a group of senior citizens. The study focused on two aspects of mental health: self-concept and general well-being. Self-concept in this study was composed of self-esteem, which is an evaluation of one's worth or significance; body image, which reflects one's assessment of the physical self; and self-image, which is a composite of feelings about oneself. Based on the literature, the investigator anticipated that the participants in the study would demonstrate an

increased level of self-esteem, self-image, and general well-being, an improved body image, and an enhanced ability to perform daily tasks as a result of participating in an exercise program.

Limitations

Several limitations of the study prohibited a generalization of the results. These are as follows:

1. The recruitment of participants was difficult and thus the number of subjects was small.
2. The participants were all women.
3. The mental health rating may have been affected by the use of volunteers since it has been demonstrated that older volunteers have more life satisfaction than older non-volunteers (Hunter, 1981).
4. The mental health rating may have been affected by extenuating circumstances such as family deaths, poor physical health or restricted finances at the time of the assessment.
5. The researcher, who was also the exercise instructor, may have affected the responses due to the expression of personal concern for and friendship with the participants.
6. The personal nature of some of the test items may have inhibited an honest answer by the respondents.

Summary

Rising health care costs necessitate finding a method to improve and/or maintain the health of our elderly population. Research has indicated that exercise may be the foundation of preventive health measures. Sidney (1978), in a study of the effects of a conditioning program on older adults, stated:

A program of physical training that improved the health and physical capacities, attitudes, and psychological well-being of older people to the point where they retained their independence would represent a significant achievement in preventive rehabilitative medicine (p.77).

Additional research, on the interrelationship of physical conditioning, mental health, and the maintenance of an independent lifestyle for the elderly, would be a step toward that achievement mentioned by Sidney.

CHAPTER 2

REVIEW OF LITERATURE

With the emphasis on youth and beauty in our culture, much of the American public has a fear of aging. The process of growing old is seen as dreadful, and deterioration of the physical and mental self is viewed as inevitable. Wrinkles, baldness, flabbiness, loss of vitality and strength, and loss of memory and mental alertness are conditions associated with aging. While some changes in physical and mental health do accompany the aging process, the retreat to a sedentary lifestyle of rocking chairs and bottles of pills is not inevitable for many people. Much of the literature on aging reports a brighter picture of our elderly population. Gerontologists have studied both mental and physical aspects of aging. The review of the literature is presented under the topics of mental health of the elderly, benefits of exercise, and the relationship between physical and mental health.

Mental Health of the Elderly

Mental health is a complex subject involving aspects such as life satisfaction, morale, emotional status, quality of self-maintenance, depression, self-esteem, and attitude toward the world and self. Although self-esteem, self-concept, self-identity, and self-image are often used interchangeably, there are subtle differences between the terms. Self-concept is a broad term involving all the elements that

comprise a view of oneself. Self-esteem refers to feelings of significance and worth (Sonstroem, 1984). Self-image and self-identity refer to descriptive phrases one might use about oneself such as optimistic, contented or relaxed. The assessment of a person's mental health is difficult and especially so in the elderly person. Due to the interaction of physical changes from aging and mental status, physicians are sometimes at a loss to determine whether a person is physically ill, or suffering from the effects of aging. In an article on functional assessment of the elderly persons, Lawton (1971) discussed the mutual interdependence of physical state, adaptive behavior and emotional state. A review of the literature in the field of mental health and aging highlighted several aspects of mental health related to the purpose of this study.

Morale

In an effort to determine differences in mental health between 264 community residents and 171 hospital subjects, Pierce and Clark (1973) found that morale was related to health. Their study indicated that community residents were significantly different from hospitalized subjects in the areas of life satisfaction, equanimity and the will to live. The authors concluded that morale has three aspects: life satisfaction; coping with day-to-day living; and anticipation of the future. According to Pierce and Clark, physical health was correlated with morale but was not a component of it. In a study to determine which factors were consistent among scales of morale, Lawton (1975) found that agitation, attitude toward one's own aging, and loneliness

were the major factors affecting morale. Lawton also stated that a person's health is highly related to morale.

Life Satisfaction

Life satisfaction is mentioned in several studies as an integral aspect of mental health. Toseland and Rausch (1979) listed 31 possible predictors of life satisfaction in a study of 871 people, aged 55 and over. They found that family life, personal health and the place of dwelling were the strongest predictors of life satisfaction. Edwards and Klemmack (1973) found socio-economic status, self-perceived health, and social interactions with a non-relative to be the most important variables related to life satisfaction. Their study included 273 women and 233 men over the age of 45.

Self-Concept and Self-Esteem

In an article on aging and the criteria of mental health, Birren and Renner (1981) discussed the difficulty of defining mental health. The authors made reference to Jahoda's criteria for good mental health among which were positive attitudes toward self, and growth development and self-actualization, which could be broadly termed self-concept. Sonstroem (1984) discussed the changes that have occurred in the theory of self-concept. The early emphasis was on treating self-concept as a unitary or global construct. The theory today is that there are multiple conceptions of the self which may be situation specific. Persons may think of themselves in different ways depending on the activity or role in which they are involved. Sonstroem did not discuss the

implications for the aged individual of the shift in thinking about self-concept.

In an effort to clarify the effect of aging on the attitude toward self, Kaplan and Pokorny (1970) interviewed 500 subjects, aged 30-60 plus years. Previous studies had reported conflicting results; some studies indicated that self-esteem decreased with age, and other studies reported the opposite effect. Kaplan and Pokorny (1970) used the Rosenberg "Scale of Self-esteem" to measure changes occurring with age. They found no significant relationship between age and self-derogation.

Although the concept of mental health is broad and difficult to define, studies of the elderly have concentrated on several major aspects. These aspects are morale, life satisfaction, and self-esteem. Results of studies indicate that physical health is closely associated with each of these aspects (Gissal, 1981; Edwards and Klemmack, 1973; Toseland and Rausch, 1979).

Mental and Emotional Benefits of Exercise

Most regular exercisers have reported mental and emotional benefits as well as physical improvements associated with their activity (Morgan, 1981; Sonstroem, 1984). They cite a general feeling of well-being as a reason for participation in a sports activity. However, the relationship between these feelings of well-being and specific attitudes about the self have sometimes been difficult to document scientifically.

Effect of Exercise on Self-concept and Self-esteem

Exercise has been used for a number of years in the treatment of depression, anxiety, and mood states. While a definite causal relationship has not been established between exercise and self-esteem, there are grounds for believing that an associative relationship exists (Sonstroem, 1984).

In a study of self-concept and locus of control and their relationship to patterns of eating, exercise and social participation, Bonds (1980) found no significant relationship among the variables. She found that high self-concept was associated with internal locus of control and related significantly to living alone, being older, having excellent self-rated health and a good appetite. In Bond's study, high self-concept was not related significantly to exercise. Gissal (1981) explored the effect of an exercise program on the morale of a group of senior citizens. She found no change in morale after the three-month program as measured by the Philadelphia Geriatric Center Morale Scale. However, a number of positive changes in activities of daily living and self-perceptions were noted in that study.

Effect of Exercise on Body Phenomena

The emphasis in our society on youth and beauty can lead to a deterioration of self-image in older people, especially as related to the body. Changes in physical condition such as flabbiness and wrinkles, and deterioration in visual and auditory acuity may result in older persons thinking of themselves as less able to function. Encouragement to "slow down and take it easy" may lead to a sedentary

lifestyle that results in further impairment of the physical self. One of the noticeable outcomes of regular exercise is improvement in physical shape and condition. This improvement may be reflected in better feelings about one's body.

Sidney and Shephard (1976) studied the effects of a regular three-month exercise program on body image, self-concept, life satisfaction, and attitudes toward physical activity in 60 men and 64 women whose average age was 65 years. Classes were held one hour a day, four times a week, with an emphasis on increasing physical endurance. Sidney and Shephard used Kenyon's "Attitudes Toward Physical Activity" (1968) and McPherson's "The Real Me" (1966) to assess changes in self-concept which was comprised of self-image and body image. McPherson states that "the purpose of this study was to assess changes in feelings and attitudes that people have about themselves" after exercise. Sidney and Shephard refer to the McPherson instrument as an indicator of mood changes. They found that individuals who exercised most often and with the greatest intensity demonstrated significant improvement in body image and mood. Those who participated less often or with less intensity had less improvement in body image and mood.

Kreitler and Kreitler (1970) reported on the body image of people over the age of 50. They indicated that older people tend to perceive their bodies as broader and heavier than they actually are. Activities of an easy nature are seen as quite strenuous, resulting in less desire to engage in physical tasks. A sedentary lifestyle leads to feelings of clumsiness and increased fear of physical activity. Inactivity results in free floating tension, insomnia, muscle degeneration,

restlessness, and fretfulness. The authors posited that regular exercise releases kinesthetic stimuli which provides emotional satisfaction and breaks the cycle of distortion in body image. Kreidler and Kreidler state further that exercise consumes free floating anxiety and prevents internalization of aggressive tendencies, both of which may lead to depression.

Kreidler's ideas were supported by Rubin (1968) who stated:

Movement is essential for physical and mental well-being...a person's self-esteem is very closely tied to the ability to control the body and function as desired....
(Rubin, 1968, p. 23).

Plutchik, Weinter and Conte (1971) developed a series of paper-pencil tests to assess aspects of body image such as body satisfaction, body appearance, preferred body proportions and body boundaries. In a study of 165 subjects aged 20-83, the authors found that worries about illness, loss of limbs, or disability were not age-related and that people with differing physical or emotional disabilities had different body images. They also found that women tended to have more concerns about their bodies than men had about their bodies.

In a discussion of the development of the ideas of body image, Fisher and Cleveland (1969) referred to a German neurologist, Pick, who postulated that individuals develop a spatial image of their bodies. The image is an inner representation of the body gained from information supplied by the senses. Through physical activity people may alter the inner picture of their body as they develop better balance, more agility, coordination, and endurance.

Jourard and Secord (1955) conducted research on the attitudes of 60 women, aged 18-36 years, toward various body parts. The women were asked to give an "ideal" measurement for a body part and then measure themselves. The "ideal" measurement was always smaller than their own actual measurement of a given body part. The researchers maintained that women lose self-esteem when their body doesn't match the "ideal." The authors used Maslow's test of security-insecurity to assess self-esteem.

Effect of Exercise on General Well-being

In addition to the physical benefits of exercise, people often report an overall feeling of well-being which has been documented in several studies. Brunner (1969) found that people experience a feeling of well-being as a result of exercise. Brunner's study of 60 men, whose average age was 30 years, indicated that those who exercised regularly were significantly different from those who did not exercise, on eight of the 24 scales on the Gough Adjective Check List. The findings led Brunner to describe exercisers as extroverted, capable, persistent, conscientious, self-controlled, assertive, and action-oriented. The motivation given by the participants for exercising was "feeling better, having more energy, being more alert, sleeping better and being less moody." In a program of progressive conditioning, Sidney (1975) found that most of the subjects who completed the 14-week program reported improvements in physical well-being and a reduction in anxiety and in the frequency of illness.

Since mental health and physical health are closely related (Kreitler, 1970; Rubin, 1968; Schaie, 1981), it may be assumed that

changes in one's physical state might affect one's mental state. The literature indicated that participants in various types of training programs reported increases in general well-being, and improvement in body image, and self-esteem.

Physical Benefits of Exercise for the Elderly

Cardiovascular Benefits

Numerous studies have demonstrated the benefits of exercise on physical health. Smith (1978) compiled an extensive list of the effects of a regular exercise program on the physiological aging process. The author cited benefits to the cardiovascular system, as well as improvement in bone strength, flexibility and muscular strength. Smith concluded that, in general, exercise does not prevent the deterioration associated with aging, but it does help people use their faculties more easily and efficiently. Smith also stated that regular exercise combats the effects of degenerative disease such as arthritis.

Barry (1966) studied the effects of physical conditioning on work capacity, cardio-respiratory function, and work electrocardiogram. The eight subjects, whose mean age was 70 years, trained on a bicycle ergometer three times per week for three months. Barry found the mean work load limit as measured on the bicycle ergometer was 76 percent higher after training. There was a significant increase in the functional responses in oxygen uptake, pulmonary ventilation, systolic blood pressure and blood lactate levels.

In a ten-week exercise program for fifteen women ages 65-82 years, Parks (1980) found significant decreases in body fat and resting heart

rates and an increase in flexibility. Parks demonstrated that a program for seniors can be safe and effective and can improve fitness even at an older age. The author concluded that such a program may even reverse some of the physiological effects of aging such as stiffness, loss of range of motion, and decreases in endurance.

Musculo-skeletal Benefits

The effects of an exercise program designed specifically to improve the range of motion in older adults was studied by Munn (1981). Munn found that the participants were able to increase their range of motion from eight to 48 percent. The subjects' personal reactions at the end of Munn's program indicated that their daily life activities and comfort in movement were affected positively by the exercise program.

Fitts and Adrian reported on the effect of aging on joint flexibility in Aging and Exercise: the Scientific Basis (Smith and Serfass, 1981). The results of their studies indicated that much of the decrease in mobility experienced by the elderly is due to lack of movement. Soft tissues, such as muscles and tendon and joint capsules, can maintain their flexibility with physical training and movement.

Osteoporosis results from a loss of calcium by the skeletal system. Commonly called "bone loss," it is a major factor in some 300,000 hip fractures in elderly women every year. The effect of exercise on the retention of bone mass has important implications in the treatment of osteoporosis (Miani et al., 1981; Smith, 1981). In a study of the effect of exercise on calcium content in the bones, Brewer (1983)

found that middle-aged women runners maintained their bone mass longer than their sedentary counterparts.

Central Nervous System Benefits

In an article on the role of exercise and brain function in the elderly, Poon (1980) suggested that physical activity increased regional blood flow which may lead to the maintenance of higher levels of perfusion of the brain due to an increase in the number of patent capillaries. A second factor in maintaining brain function is the increase in oxygen transport. Poon also stated that persons with a large lung capacity (presumably as a result of exercise) may be more able to maintain a high level of blood oxygenation.

Harris (1975) noted the effects of exercise on the central nervous system. He stated that physical activity stimulated metabolism, respiration, blood circulation, digestion, and glands of external secretion, which may protect against senility.

Disease Prevention

In a study to investigate the relationships among aging, daily exercise and clinical symptoms as measured by the Cornell Medical Index, Cheraskin (1971) found exercise especially important in reducing clinical symptoms in the over 45 age group. He emphasized the role of physical activity in any program of preventive medicine.

A more specific aspect of disease prevention which is related to exercise is the effect of regular exercise on adult-onset diabetes. Shephard (1978) found that a regular program of endurance training can reduce or eliminate the need for insulin by elderly diabetics.

Relationship Between Mental and Physical Health

In an article on the implications of biological aging, Schaie (1981) discussed the relationship between mental and physical health. He stated that a low energy level may affect the development of friendships, participation in intellectually stimulating or physically invigorating activities, and the initiation of sexual activity. Accurate assessment of an older person's health is complex, due to the interrelationships among physical and mental health and the aging process. It is often difficult for a physician to determine if ailments are physical, or from depression due to losses such as the death of a spouse, diminished hearing, or displacement from their home. Health professionals are beginning to look beyond physical symptoms in their assessments of older adults. Questions are being asked which concern mental abilities and daily functioning in addition to questions about physical symptoms. Lawton, Ward, and Yaffe (1967) analyzed 52 separate measures of health. Using factor analysis, they were able to reduce the number of useful health indicators to approximately eight items. The authors concluded that no single index can properly represent an individual's health. Lawton also maintained that the ability to function on a daily basis is a measure of mental and physical health. He developed an instrument to assess the need for health services and institutionalization based on independent functioning in the community. Lawton's "Activities of Daily Living Instrument," (1969) included shopping, food preparation, housekeeping, and handling finances.

Traditionally, mental status has been evaluated with I.Q. tests or standardized measures of mental status. For many elderly persons, these tests are not reliable. Wolinsky (1984) discussed the necessity of looking at functional elements of health status as well as more global indicators such as the standardized tests. He was primarily interested in determining the need for health services based on a person's level of functioning. He specifically suggested using activities of daily living measures to tap both global and functional dimensions of a person's health.

The nursing profession is becoming increasingly aware of the relationship between physical condition and mental health. In a book on nursing management of the elderly, Carnevalli (1975) stated that exercise has both psychological and physiological benefits. These benefits include strengthening muscles and increasing muscle tone, improving range of motion and flexibility, relieving boredom, and reducing social isolation. She stated further that older persons who cannot move about freely begin to see themselves as old and ill.

The relationship between a vigorous four-month exercise program and biochemical and personality variables was studied by Ismail and Young (1977). Although the 90 subjects, aged 21-61 years, improved markedly in fitness, the researchers found little change in personality parameters using the Cattell Sixteen Personality Factor Questionnaire. Fitness levels were assessed using data from stress tests on a treadmill, EKG heart rate monitors, and body-fat-muscle ratios. The authors stated that "a program would have to be longer and more intense to cause dramatic changes in personality parameters." (p. 66)

Wright (1980) investigated the effect of participation in selected recreation programs on morale and leisure interests of 160 senior citizens. His subjects participated in motor activities, arts and crafts, and social recreation programs. He found significant positive correlations between morale and leisure interests and morale and participation in the program.

The relationship between physical and mental health is complex. It is often difficult to determine whether physical incapacities in the elderly are due to depression, or disease, or some combination of both. The ability to maintain independence and take care of self and home is related both to physical capacities and mental state. Thus, measures of health must assess the day-to-day level of functioning of the individual as well as physical and mental abilities.

Summary

Aging is a complex process involving both physical and mental capabilities. The literature indicates that physical health is a major factor in the mental health of older people. While there are many aspects of mental health, the ones most closely associated with physical health and with activity are self-esteem, self-image, body image, and general well-being. Numerous studies have demonstrated the positive effects of exercise on physical health (Smith and Serfass, 1981). However, in spite of the connection between physical and mental health, research has not been focused on determining the effects of exercise on emotional well-being or on the relationship between exercise and daily functioning in the older adult.

It is reasonable to expect that a regular exercise program will have a significant effect on the sedentary lifestyle of elderly individuals, resulting in more vitality, increased activity, and a general feeling of well-being. These factors may in turn improve the quality of life for senior citizens by contributing to their ability to maintain an independent lifestyle. Thus, the present study was designed to investigate the effects of exercise on selected mental health variables and on the performance of daily tasks.

CHAPTER 3

METHODS AND PROCEDURES

In a previous exercise class for older adults conducted by the investigator, changes were observed in vitality, in animation, in self-expression, and in social interaction among participants. The investigator questioned whether these differences in mood and behavior reflected changes in the emotional and mental outlook of the participants as a result of the exercise program or whether these differences resulted from the social interaction among the participants. The present study was formulated in an attempt to systematically document the types of changes previously observed and ascertain the reasons for those changes.

The purpose of the study was to investigate the effect of a regular exercise program on selected aspects of mental health of a group of senior citizens and on their ability to perform daily tasks. Self-esteem, self-image, body image and general well-being were selected as specific aspects of mental health due to their close association with exercise.

The Pilot Study

Prior to beginning the study, the investigator conducted an exercise class for 18 months at the Bozeman Senior Center. The pilot study was conducted to gain experience and knowledge while working with exercise and older adults. Six women participated in the program initially. By the end of the program one and one-half years later, there were twelve women who participated regularly.

The information gained from the pilot study served as a basis for program development in the present study. The researcher used that knowledge in planning the following areas:

1. Length of the exercise program in months. Several months were required before the participants began to notice any physical changes, and additional time passed before mood differences were reported. Many other programs for older adults last three months or less with little change in personality variables of the participants. Thus, the investigator determined that it was necessary to conduct the exercise program for a minimum of one year.

2. Rapidity with which new exercises could be introduced. It was sometimes difficult for participants in the pilot study to remember the exercises and exactly how to do each one. Therefore, only one or two new exercises were introduced during any two-week period.

3. Management of agility problems. Some members had great difficulty getting up and down from the floor and rolling from side to side. Time was spent during class teaching the easiest ways to roll over, to get up on hands and knees, and to stand up. Some activities were

modified so that they could be done sitting in a chair.

4. Researcher's expectations of the physical changes in the participants. Flexibility and stamina were the first components of fitness to increase. Strength increased very slowly.

5. Knowledge of the relationship between attendance and commitment to the program. Several women attended the pilot study classes rather irregularly and eventually dropped out. Those women who attended two or three times during the first two weeks of classes maintained a commitment to the program and attended regularly.

6. Recruitment difficulties. The pilot study began with only six participants and attempts to recruit other members at the Senior Center met with some resistance. The best method of recruitment in the pilot study seemed to be word-of-mouth.

7. Format of the exercise program. The order of exercises, pacing, music, and educational information of the present exercise program was based on the information developed during the pilot study.

Effective methods of presenting the exercises and particular problems in everyday living were discussed with participants in the pilot study. The women volunteered their ideas and suggestions for improvement in the instruction and organization of the class.

In an evaluation of the pilot program, the women said that they felt more flexible, had more stamina, were less moody, slept better and were not as "stiff in their joints." They also indicated that they thought many more of their friends should participate in such a program.

Research Design

The study was designed to evaluate the effects of an exercise program on two concepts: mental health and performance of daily tasks. The mental health variables measured were self-concept, comprised of self-esteem, self-image and body image; and general well-being. The daily tasks variable was measured by the participant's perception of the ease of performance of selected tasks of every day living.

Participants

Participants were recruited with the help of the manager of a retirement complex in April, 1982. The possibility of using the facility for an exercise class which was to be the basis of a study on exercise and aging was discussed with the manager. With the manager's cooperation, a meeting was arranged in May, 1982 to explain the purpose of the study to the residents of the complex. About a dozen of the 120 residents attended the informational meeting. The study was described by the researcher as an investigation of the relationship between exercise and aging.

To be included in the study, participants had to be willing to participate in the exercise classes three times per week for one year, to complete all forms required for the study, (a fitness health survey, personal progress chart, and a final evaluation, in addition to test instruments) and to obtain a physician's permission. Participants had to be 65 years of age or older.

Only four or five of the women who attended the meeting in May volunteered for the study. With the help of the manager, additional women were recruited until a total of nine women were recruited by July 1, 1982, when the first phase of the study began. Recruitment efforts continued throughout the summer until seventeen women had agreed to participate in the study.

Fourteen of the seventeen women lived at the retirement complex in Bozeman, Montana. The other three women lived in their own homes near the complex. The participants ranged in age from 66-83 years with an average age of 77.5 years. Two of the women were married and the others were widowed. All participants were in general good health although several women had weight problems, arthritic conditions, or slight hearing or visual impairments. These health problems at times restricted their full participation in the exercise program. Only a few of the women knew each other when the study began.

Groups

The study was divided into two phases--a socialization phase and an exercise phase. The initial nine volunteers participated in the socialization phase during July, 1982. Four of those women, plus the additional thirteen recruits then formed the exercise and control groups for the second phase of the study which began August 1, 1982 and terminated June 30, 1983.

Socialization Group. Research by Wright (1980) indicated that social interaction was an important part of the "feeling better" effect experienced by the participants in an exercise program. In an attempt

to isolate the socialization effect from the effects of the exercise program, the initial nine participants met together without exercising. The socialization group met three times per week for discussion during the month of July, 1982. The purpose of the supervised discussion was two-fold: to help the members become better acquainted; and to assess the effect of simply meeting together socially. Topics of discussion included childhood experiences, hobbies and outside interests, and knowledge about diet and proper nutrition.

Exercise Group. The second phase of the study began in August, 1982, with the exercise program. There were eleven women in the exercise group, four of whom had also participated in the socialization group. The exercises used in the program were developed by the investigator and adapted from the work of Smith (1978), Frankel (1977), Rosenberg (1977), and the 1968 bulletin prepared by the President's Council on Physical Fitness and Sports in conjunction with the Administration on Aging. The specific exercises are listed in Appendix B.

At the initial meeting of the class, participants learned to take their working heart rate. They were encouraged to get their blood pressures taken at the monthly clinics at the Senior Center. After the first week of classes, each member was given a personal record sheet on which she recorded body measurements, blood pressure, resting heart rate, and the success in performing certain exercises involving flexibility and strength. The personal record sheet is found in Appendix A. The women were asked to record their progress every three months during the study on the personal record sheet. The record keeping was

