

THE EXPERIENCES OF OLDER ADULTS WITH CHRONIC PHYSICAL  
IMPAIRMENTS IN A SIX-MONTH EXERCISE PROGRAM:  
EFFECTS ON QUALITY OF LIFE, SELF-ESTEEM AND SELF-EFFICACY

By

Andrea Bedard

A Thesis

In Partial Fulfillment of the Requirements  
for the Degree

MASTER OF SCIENCE

Faculty of Physical Education and Recreation Studies  
University of Manitoba  
Winnipeg, Manitoba

September, 1998



National Library  
of Canada

Acquisitions and  
Bibliographic Services

395 Wellington Street  
Ottawa ON K1A 0N4  
Canada

Bibliothèque nationale  
du Canada

Acquisitions et  
services bibliographiques

395, rue Wellington  
Ottawa ON K1A 0N4  
Canada

*Your file Votre référence*

*Our file Notre référence*

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-32900-3

**Canada**

**THE UNIVERSITY OF MANITOBA  
FACULTY OF GRADUATE STUDIES  
\*\*\*\*\*  
COPYRIGHT PERMISSION PAGE**

**THE EXPERIENCES OF OLDER ADULTS WITH CHRONIC PHYSICAL  
IMPAIRMENTS IN A SIX-MONTH EXERCISE PROGRAM:  
EFFECTS ON QUALITY OF LIFE, SELF-ESTEEM, AND SELF-EFFICACY**

**BY**

**ANDREA BEDARD**

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University  
of Manitoba in partial fulfillment of the requirements of the degree**

**of**

**MASTER OF SCIENCE**

**Andrea Bedard      ©1998**

**Permission has been granted to the Library of The University of Manitoba to lend or sell  
copies of this thesis/practicum, to the National Library of Canada to microfilm this thesis  
and to lend or sell copies of the film, and to Dissertations Abstracts International to publish  
an abstract of this thesis/practicum.**

**The author reserves other publication rights, and neither this thesis/practicum nor  
extensive extracts from it may be printed or otherwise reproduced without the author's  
written permission.**

## ABSTRACT

### THE EXPERIENCES OF OLDER ADULTS WITH CHRONIC PHYSICAL IMPAIRMENTS IN A SIX-MONTH EXERCISE PROGRAM: EFFECTS ON QUALITY OF LIFE, SELF-ESTEEM AND SELF-EFFICACY

The purpose of this study was to examine the effects of a six month exercise program on the quality of life, self-esteem and self-efficacy of older adults with chronic physical impairments, and to describe their experiences while in the program. The subjects were five participants in the Kinsmen Reh-fit Centre's "Nooners" program - an exercise class for older adults with substantial physical impairments (stroke, heart disease, arthritis, osteoporosis, etc.). The subjects were interviewed both pre and post-intervention as well as at two mid-points in November and January. The interviews probed the individual's attitude towards physical activity, as well as their perceived benefits and barriers to joining this program, and the amount of social support they received. Three psychometric instruments were filled out pre- and post-intervention and were used to measure quality of life, self-esteem and self-efficacy.

The data were combined and five case studies developed to describe each subject's experiences in the exercise program. Interview and observation data revealed the themes common to each subject. These themes were: dependence, depression, support, expectations, physical improvements, social interaction and effort. Results of the psychometric instruments indicated that three out of five subjects recorded an increase in quality of life, subject's self-esteem scores increased or were maintained and all of the self-efficacy scores either decreased or remained unchanged.

Overall, it was concluded that this type of exercise program was beneficial to older adults with chronic physical impairments.

## ACKNOWLEDGEMENTS

The completion of this study is due to the wonderful support of a number of people to whom I am deeply grateful.

First, I would like to thank my committee: my advisor Dr. Vic Corroll, and Dr. Janice Butcher both from the Faculty of Physical Education and Recreation Studies, and Dr. John Bond from the Faculty of Human Ecology.

Thank you to my husband Pierre and my family who believed I could finish this study even when I did not.

The study would not have been possible if not for the Board members and Staff at the Kinsmen Reh-fit Centre for allowing me access to their facility and participants.

Finally, I would like to thank my five "Nooners program" participants for their time, patience and generosity in agreeing to be subjects for this investigation.

## TABLE OF CONTENTS

LIST OF TABLES	vi
LIST OF FIGURES	vii
CHAPTER ONE	
INTRODUCTION	1
Statement of the Problem	4
Rationale	4
Overview of the Study	5
Definition of Terms	6
Physical Terms	6
Psychological Terms	6
Methodological Terms	6
Delimitations	7
Limitations	7
CHAPTER TWO	
REVIEW OF LITERATURE	8
Chronic Physical Impairments	8
Stroke	8
Heart Disease	10
Diabetes	11
Arthritis/Osteoporosis	12
Multiple Sclerosis	14
Head Injury	15
Quality of Life, Self-esteem and Self-efficacy	17
Quality of Life, Self-esteem and Self-efficacy in Individuals with Chronic Physical Impairments	18
Effects of Exercise on Chronic Physical Impairments	21
Physical Health	21
Quality of Life	24
Self-esteem	26
Self-efficacy	26
The Importance of Social Support in Exercise Programs	27
Qualitative Research on Chronic Illness and Exercise	29
CHAPTER THREE	
METHODS AND PROCEDURES	31
Overview of Study	31
Permission	31
Setting	31
Recruitment of Subjects	32
Characteristics of Subjects	32
Exercise Intervention	33

Description of Qualitative Methodology	34
Internal Validity	35
External Validity	36
Reliability	36
Guidelines for Interviewing	36
Characteristics of the Interviewer	38
Characteristics of the Interview	39
Guidelines for Participant Observation	40
Qualitative Measures Used in Study	42
Interviews	42
Observations	42
Psychometric Instruments	43
Medical Outcomes Study Short-form General Health Survey (MOS)	43
Self-esteem Scale	44
Self-efficacy Scale	45
Data Collection	45
Analysis of Data	46
Analysis of Interview Data	46
Analysis of Observation Data	47
Analysis of the Psychometric Instruments	48
 CHAPTER FOUR	
RESULTS	50
Observations of the Facility and Exercise Program	50
Facility	50
Exercise Program	52
Social Aspects	53
Case Studies of Five Subjects	54
Subject One	54
Subject Two	63
Subject Three	70
Subject Four	74
Subject Five	81
Themes Emerging from Interviews/Observations	88
Characteristics of the Subjects	89
Dependence	89
Depression	91
Support	93
Expectations	96
Benefits of the Program	98
Physical Improvements	98
Social Interaction	102
Participation in the Program	105
Effort	105

Quantitative Results	109
MOS	109
Rosenberg's Self-esteem Scale	113
Self-efficacy Scale	115
CHAPTER FIVE	
DISCUSSION	117
Relationships Between Themes	117
Relationship of Themes to Psychometric Instrument Data	118
MOS	118
Rosenberg's Self-esteem Scale	119
Self-efficacy Scale	120
Comparison to Other Studies	121
Quality of Life	121
Self-esteem	122
Self-efficacy	122
CHAPTER SIX	
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	124
Conclusions from Case Studies	124
Summary of Themes	125
Summary of Psychometric Instruments	125
Final Conclusions	126
Subject Follow-up	126
Recommendations for Future Programs	126
Recommendations for Future Studies	127
REFERENCES	128
APPENDICES	
A - Interview Checklist	134
B - Pre-intervention Interview	135
C - Post-intervention Interview	137
D - Mid-program Interview	139
E - Short-form General Health Survey, Medical Outcomes Study	140
F - Rosenberg's Self-esteem Scale	143
G - Self-efficacy Scale	144
H - Consent Form	145
I - Introduction to the Interview	146



## LIST OF TABLES

Table 1. Characteristics of subjects: age, gender, impairment(s) and date of impairment diagnosis	33
Table 2. Definitions of Health Concepts of the MOS	44
Table 3. Self-esteem scale numbers and corresponding item number(s)	48
Table 4. Scores on Psychometric Instruments	109
Table 5. MOS subscale scores for each subject	111
Table 6. Mean scores for MOS subscales, total scores and differences	113

## LIST OF FIGURES

Figure 1. Kinsmen Reh-fit Centre Fieldhouse	51
Figure 2. MOS scores before and after exercise intervention for each subject	110
Figure 3. Self-esteem scores before and after exercise intervention for each subject	114
Figure 4. Self-efficacy scores before and after exercise intervention for each subject	116

## CHAPTER ONE

### INTRODUCTION

Research on the experiences of older adults in exercise programs has recently become a hot topic because of the population surge of the aging "baby boomers". Studies on exercise and older adults have looked at everything from how exercise affects physical outcomes such as increasing muscle mass (Charette et al. 1991) or aerobic endurance (Foster, Hume, Byrnes, Dickson & Chatfield, 1989), to the exercise effects on psychological constructs such as quality of life (Barry, Rich & Carlson, 1993; Psychology Position Statement, 1992). Gauvin and Spence (1996) reviewed the outcomes of 90 studies to clarify the relationship between physical activity and psychological well-being, and to identify gaps in the knowledge of this relationship. Their conclusion was that no causal relationship has ever been established between physical activity and any psychological construct (including self-esteem and self-efficacy); yet exercise continues to be encouraged and prescribed by medical and fitness professionals. The United States Surgeon General's Report released in 1996 also highlighted a great deal of research on the positive effects of physical activity on many psychological constructs including the three that were measured in this study: quality of life, self-esteem and self-efficacy. The conclusion was that moderate amounts of physical activity improved health and quality of life (U.S. Department of Health and Human Services, 1996).

The constructs of quality of life, self-esteem and self-efficacy were chosen for this study because little research has been done regarding individuals with chronic physical impairments. It is also important to know, from a program implementation perspective, what needs to be considered with this population as they attend exercise programs. For example, it is known that self-efficacy is a main determinant of exercise adherence; therefore exercise leaders should be aware of how to foster an improved

self-efficacy from their participants. How can exercise programs improve the quality of a person's life, as well as their self-esteem and self-efficacy?

Historically, Fallowfield (1990) suggested that near the end of World War II, quality of life was associated with "living the good life", which included owning many material possessions and having prestige. In 1960, President Eisenhower requested a report by the Commission of National Goals that defined quality of life as including education, health and welfare, and economic growth for the entire country (Fallowfield, 1990). Then in the late 1960's there was a shift from material possessions towards national freedom, leisure, emotion and enjoyment for a high quality of living (Ebbs, Fallowfield, & Fraser, 1989; In Fallowfield, 1990). In recent physical activity-based research, the term that is used is *health-related quality of life*. Health-related quality of life is a multidimensional construct that encompasses those attributes valued by individuals including: comfort or sense of well-being, the extent to which physical, emotional and intellectual functioning are maintained, and the ability to sustain family, work and community activities (Wenger & Furberg, 1990). The present study was based on Stewart and King's (1991) concept of quality of life because it included six constructs that encompassed physical, emotional and social functioning, as well as general health perception, pain and role functioning. All of these constructs are health-related quality of life constructs.

The medical profession has become increasingly aware of quality of life as an outcome of a patient's therapy. Physicians must consider any intervention as a balance between iatrogenic, or treatment-induced harm, and therapeutic benefit (Cella, 1992). Exercise is seen as having many benefits and few side effects as opposed to, for instance, medications in the treatment of different types of medical conditions. For example, physicians encourage their patients to engage in regular physical activity to deal with anxiety and depression (Canadian Fitness and Lifestyle Research Institute, 1994). Self-esteem is another important psychological construct

that has been studied in relation to physical activity and its benefits. Self-esteem is defined as being multidimensional (ie. having components such as physical self-concept, academic self-concept, social self-concept. etc.) and hierarchically structured with global self-esteem at the apex of the pyramid with successively more specific components at lower levels. It is both descriptive and evaluative in nature (Wankle, 1994). The results of studies reviewed by Folkins and Sime (1981), and Leith and Taylor (1989) clearly indicate that participation in various physical activity/exercise programs increases self-esteem in a variety of subjects, including older adults.

The third psychological construct to be measured in this study was self-efficacy, or a person's perceived capacity to perform specific behaviours (Bandura, 1977). In the physical activity literature, the behaviours have been fitness activities or adherence to an exercise program. Research indicates that physical activity is related to improved self-efficacy (McAuley, 1994). Self-efficacy changes are greatest among those persons with lower initial self-efficacy scores at the beginning of an exercise program (McAuley, 1994).

Exercise is now a widely accepted method for primary and secondary prevention of many illnesses that can develop as people age. The subjects in this study all had a chronic physical impairment including stroke, heart disease, diabetes, arthritis, osteoporosis, multiple sclerosis, head injury or a combination. The Surgeon General's Report clearly states that a moderate amount of physical activity on a regular basis can improve one's health and quality of life. It also states that "Among people compromised by ill health, physical activity appears to improve their ability to perform activities of daily living." (US Department of Health and Human Services, 1996, p.142). Can physical activity improve lives in other ways by making people feel better about themselves, by providing an opportunity to make friends and get out of the house, and by improving the way individual's bodies feel and move? There is not a large body of literature about the experiences of older adults with chronic physical impairments

participating in exercise programs. These individuals may have a greater need than the general public to improve the quality of their lives because some of that quality has been removed by the chronic physical impairment.

### Statement Of The Problem

The purpose of this study was to describe the experiences of older adults with chronic physical impairments in a six month exercise program, and to determine the effect of exercise on quality of life, self-esteem and self-efficacy.

### Rationale

As stated in the introduction, the study of exercise and its effects on the quality of life of older adults with chronic physical impairments is relatively new, and the body of research is limited. The results of the study will help to expand the literature on quality of life, self-esteem and self-efficacy as they relate to exercise and older adults with chronic physical impairments.

The study provided information about how exercise programs could improve the lives of older adults with chronic physical impairments. It may help in designing exercise programs to meet the holistic needs of this population. This in turn can show physical activity specialists the importance of running such programs, and the need for the development of exercise programs with emphasis on improving quality of life, self-esteem and self-efficacy. The contributions to programming include the ability to predict adherence, the perceived benefits and barriers of older adults participating in exercise programs, and the importance of the social aspect of exercise programs. This study was unique in that it combined both qualitative and quantitative methods of data collection and analysis.

### Overview of the Study

In September of 1994, the Kinsmen Reh-fit Centre, located in Winnipeg, Manitoba, began a new exercise class for individuals with chronic physical impairments. This class provided a unique research opportunity as the subjects had not previously participated in any structured exercise program. Their experiences provided feedback on the barriers, benefits, social interactions, and physical and psychological improvements made possible by an exercise program. It also provided information on types of programs that are beneficial to this population for future program planning and implementation.

The five subjects had a variety of chronic physical impairments including stroke, heart disease, diabetes, arthritis, osteoporosis, multiple sclerosis, and head injury. They ranged in age from 48 to 85 years. Four of the subjects were male, and one was female. Subjects participated in an exercise program at the Kinsmen Reh-fit Centre consisting of 30 minutes of stretching and muscular endurance exercises while seated in a chair, and 30 minutes of cardiovascular exercises including walking, cycling and/or the use of an arm ergometer.

Two methods of data collection were used. Qualitative data were gathered through pre and post-intervention interviews with the subjects, as well as two shorter mid-program interviews in November and January. The leader of the program was interviewed at the three- and six-month mark of the study and her observations of the participants were recorded. The interviews enabled the researcher to investigate the motives, benefits, barriers and social supports related to participation in the program as perceived by the participants. The researcher observed the class and made field notes bi-monthly to observe social interaction, physical changes and compliance. Quantitative data were gathered using three psychometric instruments that measured quality of life, self-esteem, and self-efficacy. These instruments were completed by subjects before and after the intervention.

## Definition of Terms

The following terms are crucial to the understanding of this research study:

### Physical Terms

Activities of Daily Living: activities and functions performed on a daily basis that are necessary for independent living (eg. grocery shopping, toileting skills)

Chronic Condition: "A nonreversible pathological alteration in the body that generally requires long periods of supervision, observation, care and rehabilitation" (Kerson & Kerson, 1985, p. 1).

Chronic Physical Impairment: The same as a chronic condition, but limited to the physical functioning of the human body.

Health Behavior: "Any activity undertaken by a person believing themselves to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic stage" (Kasl & Cobb, 1966; In Stenback, Kumpulainen and Vauhkonen, 1978, p. 58)

### Psychological Terms

Quality of Life: Stewart and King (1991, p. 108) state that "quality of life is defined in terms of multiple concepts pertaining to day-to-day functioning and well-being". These concepts include physical and cognitive functioning, activities (role, social, self-maintenance), bodily well-being, emotional well-being, self-concept, global perceptions (health, life satisfaction).

Self-esteem: Self-esteem refers to the liking and respecting of oneself, or the feelings of satisfaction with oneself (Stewart & King, 1991).

Self-efficacy: The belief that one is capable of performing behaviors that produce a certain outcome (Willis & Campbell, 1992).

### Methodological Terms

Convenience Sample: A type of non-probability sample in which subjects are selected according to their availability (Rea & Parker, 1992).

Psychometric Instrument: An instrument that is used to measure aspects of



some subjective aspect of life. It is an instrument that assigns numbers to subjective judgments for analysis (McDowell & Newell, 1987).

Triangulation: The process of supplementing one type of data collection with another for verification, further detail, or for aiding the interpretation of the data (Gorden, 1980).

#### Delimitations

1. This study was limited to individuals who were participants in the Nooners exercise program at the Kinsmen Reh-fit Centre.

#### Limitations

1. The study sample consisted of five volunteer subjects as a convenience sample, so results are not generalizable to the entire population.
2. The outcomes depended on the compliance of the subjects to the program.
3. The study was limited by the ability of the subjects to respond to the questions in the psychometric instruments.
4. The study was limited by the difficult nature of analyzing qualitative data.

## CHAPTER TWO

### REVIEW OF LITERATURE

Several topics were reviewed that are relevant to the study. First, the definition and etiology, treatment and psycho-social effects of six chronic physical impairments are outlined. Next, the definitions of quality of life, self-esteem and self-efficacy are given, then these constructs are discussed in individuals with chronic physical impairments. The relationship between these constructs and exercise is discussed, followed by the importance of social factors in exercise programs. Finally, because this study used qualitative research, the review of literature concludes with an examination of qualitative research on chronic illness and exercise.

#### Chronic Physical Impairments

To better understand the subjects who are participants in the Nooners program, it is imperative to understand their chronic physical impairments, how the impairments are treated, and how they affect the psycho-social aspects of the participants' lives. A chronic condition is defined as a "nonreversible pathological alteration in the body that generally requires long periods of supervision, observation, care and rehabilitation" (Kerson & Kerson, 1985, p. 1). In this section several chronic physical impairments present in the subjects for this study will be described and their definitions, etiologies, treatments, and psycho-social effects will be discussed. The following information, unless otherwise stated, was derived from Kerson and Kerson (1985).

#### Stroke

Definition and Etiology. A stroke is the death of an area of the brain, caused by bleeding, a clot or some type of obstruction in the vessels in the brain tissue. There are three types of stroke. A thrombosis is a clot formed in an artery that supplies blood to the brain. The clot can be caused by excessive blood viscosity, excessive platelets in the blood, or atherosclerosis. An embolus is a clot that has formed elsewhere in the

body, but has travelled into an artery that leads to the brain, and has occluded blood flow there. This type of stroke often accompanies cardiac disease. The third type of stroke is caused by a hemorrhage where an artery wall has burst, and the bleeding causes compression in the brain.

The area of the brain where the stroke occurs dictates what part or parts of the body are affected, and to what degree. Disability usually occurs in an entire side of the body (hemiplegia) although sometimes only the face, one limb or part of a limb may be affected.

In right-brain injuries (left hemiplegia) individuals would be paralyzed on the left side of the body. They would have difficulty with spatial perception, and they would tend to over-estimate their capacities. They may also experience slurred speech, and bouts of unexplained crying spells.

A left-brain injury (right hemiplegia) causes paralysis on the right side of the body. There will be a disruption in the individual's ability to use and construct words and phrases (aphasia). Behavior may be affected which may include a shorter attention span, and an altered personality (more depressed, angry, or irritable than before the stroke, for instance).

Symptoms of a stroke are fatigue, only being able to do one thing at a time, a decreased capacity to remember things, and inappropriate laughing or crying.

Treatment. The main treatments for stroke are drug therapy or surgery. Drugs are used to treat the underlying cause of the stroke, or to prevent recurrence. Anti-hypertensives and antifibrinolytic medication prevent clots, and steroids prevent brain swelling. Surgery can be either preventative or therapeutic. Bypass procedures and removal of an atheromatous from an artery are two methods of preventative surgery. Craniotomy to drain a cranial hematoma, and the clipping of an aneurysm to prevent re-rupturing are types of therapeutic procedures.

Psycho-Social Effects. Activities that a person used to do with ease cannot be

done, or they take a huge amount of effort after a person has a stroke. This can cause some depression. If speech is affected, a person's social life may suffer, and again, depressive symptoms may occur. There may be a certain amount of familiar strain when the mother, who has always taken care of the rest of the family suddenly needs that care herself. "A stroke is an enormous blow to an individual's self-concept" (Kerson & Kerson, 1985, p. 237). There may be a slight change in appearance after a stroke: a drooping of one side of the face or a dragging of the limbs on one side of the body. This too contributes to a lesser self-concept.

### Heart Disease

Definition and Etiology. "Heart disease is any abnormal condition of the heart or its function in maintaining blood circulation" (Kerson & Kerson, 1985, p. 149). The four most common forms of heart disease are myocardial infarction, angina, stroke and congestive heart failure. These are all caused by cardiovascular atherosclerotic disease. In atherosclerotic cardiovascular disease, the body's arteries gradually narrow over many years due to a build-up of fatty material known as plaque. This decreases the amount of blood available to the part of the body fed by this system: usually the heart, brain or legs.

Myocardial infarctions occur when blood is occluded from reaching the heart, and part of the heart muscle dies. Angina is recurrent chest pains caused by a decreased blood flow to the heart because of the narrow arteries. Stroke was discussed in the previous section of this paper. Congestive heart failure is when the heart is unable to pump a sufficient amount of blood, and fluid accumulates in the abdomen, legs, and the lungs. Symptoms include fatigue, shortness of breath and swelling of the feet and ankles.

Treatment. Treatments for heart disease include modifying risk factors, drug therapy and surgery. Patients are urged to quit smoking, maintain a healthy weight by eating low-fat, low-cholesterol foods, and getting moderate amounts of exercise, and

by managing stress. Medications are used to increase blood flow, or to decrease the demand for oxygen. Surgery is used for the relief of symptoms and to inhibit the disease process.

Psycho-social Effects. After a heart attack, a person may live in fear of having another more serious, or fatal attack. There can be a level of depression because one must slow down their pace of life for a while. Family members tend to be anxious and concerned, and this may put a strain on relationships. Stress and anxiety are something a heart attack victim should avoid since both can be precursors to heart attack.

People get depressed usually three to five days after hospital admission. Denial is another usual response after a heart attack, and it is characterized as either regressive, aggressive, or constructive. Denial is not altogether bad however, because it helps the person cope with the feelings of depression, anxiety and fear often felt after the heart attack.

## Diabetes

Definition and Etiology. Diabetes is a condition that does not allow the body to convert food into energy properly. Insulin regulates the flow of glucose, so when the pancreas produces little or no insulin, sugar builds up in the blood. Factors that lead to the development of diabetes are heredity, obesity, aging, physical and emotional stress and pregnancy.

There are two types of diabetes. Type I is known as insulin-dependent, and it is often diagnosed in childhood or adolescence. In this type, diabetics must inject themselves with insulin to regulate the blood sugar. Type I, if untreated, can quickly result in a coma or death. Type II is non-insulin-dependent because the pancreas produces some insulin. It is usually diagnosed after 40 years of age and can be managed by eating a proper diet.

Treatment. Treatment for diabetes aims to make up for the deficiencies caused

by the disease and to slow down the rate of complications. Type I diabetics must use insulin. Each day they measure their blood sugar levels with a home blood-testing kit. Some individuals with Type II diabetes take oral medication to stimulate the pancreas to produce insulin but most people with Type II can manage their illness with diet and exercise.

Psycho-social Effects. Stress is a critical factor to manage in diabetes because when a person feels stressed, it is harder to recognize the beginning of shock - they both have similar symptoms including sweating and a rapid heart rate. It is essential for a person with diabetes to learn relaxation techniques.

Diabetes is also an issue that the whole family has to deal with. When a person goes into shock, they must depend on a family member to administer treatment. In this way, dependence on others becomes an issue for people with diabetes.

Since most social events revolve around food it is difficult, but crucial, that diabetics take care with their diets. This can affect an individual's social life in that they may feel uncomfortable going out to dinner and not being able to eat and drink like everyone else.

Diabetes affects self-concept, especially in Type I where insulin rules the person's life. A lack of control is felt by the person with diabetes. Diabetics may also experience anger about their condition.

### Arthritis/Osteoporosis

Definition and Etiology. Arthritis and osteoporosis will be discussed together because their onset, impairments and psycho-social factors are similar.

Arthritis is an inflammation of the joints. Many conditions fall under the term arthritis but the two main types are rheumatoid and osteoarthritis. Rheumatoid arthritis occurs from an unknown origin, and is diagnosed in middle age. Inflammation occurs in the joint, membrane cells divide, and cells from other parts of the body enter the joint. Gradually over a period of years, bone and cartilage in the joint are broken down

by enzyme activity inherent to the disease. Affected areas include wrists, knuckles, knees, feet, hips and spine.

Osteoarthritis occurs in older adults and affects the weight-bearing joints of the body (hips, knees, spine). It is the most common form of arthritis. In osteoarthritis, articular cartilage is destroyed and spur formation occurs that causes impaired function of that joint.

Osteoporosis is a progressive loss of bone material that causes the bone to weaken. There are also two types of osteoporosis. Type I or post-menopausal osteoporosis occurs in women after menopause, and it is characterized by fractures of the distal radius and vertebrae. Type II or senile osteoporosis occurs in men and women after the age of 75. Hip fractures are the common manifestation in type II osteoporosis (Caine & Bothwell-Myers, 1989).

Treatment. Both arthritis and osteoporosis are chronic, physically limiting and painful diseases. The treatment for arthritis aims to maximize joint flexibility and protection, and to minimize pain. Anti-inflammatory medication, rest, stress reduction and exercise are the common treatments for arthritis.

Calcium supplements, hormone replacement therapy and regular, weight-bearing exercise to maintain bone mass and prevent further loss are the recommended treatments for osteoporosis (Caine & Bothwell-Myers, 1989; Horner, 1989).

Psycho-social Effects. The loss of spontaneous mobility is a major factor with arthritis and osteoporosis. Before going out, the person must think to "Will I be able to make it that far?" If mobility is hampered, they may become depressed and withdraw from social functions. Self-concept is also affected especially for people with rheumatoid arthritis and osteoporosis because of the physical deformity that occurs with the disease (gnarled hands, Dowager's hump). The disease may progress to the point where the individual is completely disabled and becomes dependent on others

for daily activities. This can be another source of depression and anxiety

### Multiple Sclerosis

Definition and Etiology. Multiple Sclerosis (MS) is a chronic disorder of the central nervous system (CNS) that is evident when small sections of the myelin sheath that insulate nerve tissue begin to strip away causing an interruption in nerve transmission (Carroll & Dorman, 1993). Oligodendrocytes and astrocytes repair the damaged area, but cause scar tissue or gliotic plaques to form as they rebuild. These plaques become hard (sclerotic) which can obstruct the flow of nerve impulses.

Only ten percent of MS patients experience multiple disturbances and rapid development of severe symptoms that leave them partially or totally incapacitated. This is the most severe case. The other 90% of individuals with MS develop symptoms ranging from a single episode with no further symptoms, to a slow and steady progression of flare-ups as time passes. The types of symptoms that are produced depend on the size of the plaque, where in the CNS the plaque is located, and how many plaques are present at a given time. Common symptoms include visual disorders, speech abnormalities, movement, balance and co-ordination problems, numbness and tingling, altered mental condition, spasticity and tremor, weakness and fatigue, bladder and bowel disturbances and sexual changes (Carroll & Dorman, 1993).

MS is usually diagnosed between the ages of 15 and 45 years of age. Women are more likely to develop MS than men. Causes are still unknown but the four most recognized theories are related to 1) heredity, 2) auto immunity, 3) virus, or 4) a combination of 2 and 3.

Treatment. Multiple sclerosis is a medically manageable disease. Symptoms can be controlled or reduced by medication, exercise, rest, physical therapy, occupational therapy and maintenance of health.

Steroid treatment is used for severe and long-lasting symptoms that have no



apparent sign of remission. ACTH (adrenocorticotrophic hormone) may be prescribed to suppress the actions of the immune system and lower antibody production. This will reduce inflammation and, in theory, disable the parts of the immune system that produce auto immune reaction.

Spasticity can be relieved through medication or by physical therapy. Stretching exercises are especially beneficial in managing spasticity (Arndt et al. 1991). The purpose of physical therapy is to stretch shortened muscles and to strengthen unaffected muscle groups for the maintenance of mobility (Carroll & Dorman, 1993; Schapiro, 1991).

Other forms of symptom control include medication and/or catheterization for bladder/bowel control, occupational therapy for activities of daily living (ADLs), pain relief in the form of over-the-counter analgesics, anti-convulsants for facial pain, and anti-depressant medication. Medications to combat fatigue, ambulatory aids, treatment of tremors with medication or exercise, therapy to alleviate speech and swallowing disorders, and help for vision problems may also be required in the treatment of symptoms of MS.

Psycho-social Effects. After the diagnosis, the most prominent reactions of the patient tend to be denial, anger, and depression. The caregivers also may experience these reactions. The progression of behaviours is shock, denial, anger, depression and finally acceptance (Carroll & Dorman, 1993). Patients diagnosed with MS should be warned not to compare their symptoms to others because every case is different. They should maintain a close relationship with their doctor, find out everything they can about the disease, find out what their new impairments are and make necessary changes, and maintain a positive outlook on life (Carroll & Dorman, 1993).

### Head Injury

Definition and Etiology. Head injuries can be classified as either primary where brain damage occurs at the moment of impact, or secondary where brain

damage occurs as a result of pathological processes. The severity of a head injury depends on location, the direction of impact, and the magnitude of the force.

Primary head injury usually involves a loss of consciousness for 15 minutes to one hour, followed by post-traumatic amnesia (PTA). The duration of the loss of consciousness and the PTA are used to determine the severity of the head injury. Symptoms occurring after a concussion can include headache, dizziness, lack of coordination in hands and fingers, and impaired memory, concentration or calculation.

Brain damage can be local or diffuse. High velocity damage that produces brain movement inside the skull usually causes diffuse brain damage and possible coma. Other results of head injury that may occur are: impaired respiratory function, altered cognitive and behavioural function, altered sensations, and altered motor performance.

Treatment. Head injury often affects the brain's ability to integrate, organize and process information necessary to perform activities of daily living. Occupational therapists aim to optimize performance of these tasks. When a head injury patient begins emerging from a coma, sensory stimulation is a primary focus. This type of input can consist of ice or light touch (tactile), rocking/rolling (vestibular), light (visual), clap or voice (auditory), banana, mustard scent (olfactory), and sweet, salty or sour solutions (taste). Sensory-perceptual programs are also offered as treatment to re-develop patterns of movement for sitting, reaching for an object, holding an object, etc. (Kovich & Bermann, 1988).

Treatment of cognitive functions must also occur. The patient may require orientation to person, place and/or time. Memory and attention can also be affected by a HI. An example of helping the individual who has memory loss is through the use of a memory book. This book contains appointments, daily schedules and a list of things the patient must do every day.

Physical aspects of rehabilitation may be required to treat balance and co-

ordination loss, muscle atrophy from prolonged bed rest, respiratory problems or any areas in the body affected by the damaged area in the brain. Treatment and recovery can be a long and arduous process depending on the severity of the injury. The patient may never totally regain lost abilities (Kovich & Bermann, 1988).

Psycho-social Effects. An individual with a head injury may display personality and behavioural changes that do not fit with pre-injury persona or role (Bermann, 1988). These changes are difficult for both the patient and the family to deal with. Symptoms may include depression, passivity, aggressiveness or loss of social inhibitions. Therapists can use activities to either channel aggressive behaviour, increase self-esteem or combat depression including the use of groups.

In general, families and caregivers report that behavioural problems are more stressful than physical impairments, and patients found that the loss of independence was the most stressful problem to deal with (Kovich & Bermann, 1988). Patients may also go through a period of agitation during their recovery.

Behaviour and cognitive problems may be transitory or prolonged. Role adjustment may be the most difficult change for the family because individuals with a head injury often cannot perform pre-injury role duties such as making decisions, working, driving or performing basic ADLs. This can lead to stress, frustration and depression (Bermann, 1988).

#### Quality of Life, Self-esteem and Self-efficacy

The researcher attempted to measure the quality of life, self-esteem and self-efficacy of the participants in the Nooners program. As of yet, there is no agreed-upon organizational framework to describe what is meant by quality of life (Stewart & King, 1991). Stewart and King's model defines quality of life as "people's overall evaluation of their lives" (p.110), and they use multiple concepts that deal with day-to-day activities. These concepts fall into two main categories: i) *functioning* defined as

people's ability to perform their daily tasks and activities, including physical function, cognitive function, and activities (self-maintenance, role, social and hobbies), and ii) *well-being* which is the subjective evaluation of an individual's life, including dimensions of pain, energy/fatigue, sleep habits, emotional well-being (anxiety and depression), self-concept and global perceptions (current health perceptions and life satisfaction). If these factors are all subjectively evaluated by an individual as being positive, the individual is considered to have high quality of life. Some authors refer to this as health-related quality of life, and distinguish it from quality of life by adding objective measures such as socioeconomic status, education, and occupation to the definition. This paper will consider only the subjective view of quality of life.

Self-esteem is defined by Wankle (1994) as the evaluative aspect of an individual in terms of how the person feels about themselves, and positive and negative reactions to the perceived characteristics. Stewart & King (1991) define self-esteem as the liking and respecting of oneself, or the feelings of satisfaction with oneself.

Self-efficacy is the belief that one is capable of performing a behaviour that will produce a certain outcome (Willis & Campbell, 1992). It is a central concept of Bandura's social learning theory (1977) as it refers to the individual's assessments of their competency to perform a specific behaviour successfully.

### Quality of life, Self-esteem and Self-efficacy in Individuals with Chronic Physical Impairments

The frequency of chronic impairments in people over age 65 is approximately 65% (Stenback, Kumpulainen, & Vauhkonen, 1978). Patients with chronic impairments account for a large percentage of the health care dollar. It is essential for physicians to evaluate the effectiveness of their interventions by measuring the quality of life and well-being of their patients to make sure the intervention is meeting the needs of the patient. This may result in a decrease in health care costs in future years

(Stewart et al, 1989). It is assumed that if a person has a physical impairment that impedes any of the areas of their life, the quality of their life will decrease. It is very likely that some individuals may have two or three chronic conditions at one time.

The following section highlights some of the recent research on how quality of life, self-esteem and self-efficacy are affected in individuals with chronic physical impairments. Pearlman and Uhlmann (1988) studied 126 elderly out-patients with five common chronic impairments (arthritis, heart disease, lung disease, diabetes and cancer). Patients answered questions pertaining to their global quality of life with responses ranging from "About as good as it can possibly be" to "Terrible. Quality of life is very bad". Open-ended questions about situations that may have recently affected the patients' quality of life were included, and the physicians were asked to rate their patients' quality of life. The researchers found that patients with heart disease and cancer had the lowest quality of life scores as compared to the other groups, although there was no statistically significant difference between any of the disease groups. Overall, patients regarded their conditions as a little more than "slightly limiting their quality of life". The associations between patient and physician ratings of quality of life were very weak. This could be because the physicians do not witness the patient's day-to-day activities, and also because of the focus on the disease in the short physician-patient relationship. One of the downfalls of this study is that it does not compare the quality of life of individuals who do not have chronic impairments to the groups of patients who do have chronic impairments.

In a study done by Stewart et al (1989), patients with chronic impairments showed lower scores on the Medical Outcomes Study, Short-form General Health Survey (MOS) than patients with no chronic conditions. Nine chronic conditions were studied, and 9385 adult patients were compared to both patients without chronic conditions, and the general population. The researchers found that no matter which chronic condition an individual had, it was associated with adverse effects on their

quality of life.

Ahlsio, Britton, Murray and Theorell (1984) studied the quality of life of patients after a stroke, and how their quality of life was influenced by the disablement and psychological factors. Ninety-six patients who had been admitted to the stroke unit of a Swedish hospital for acute medical advice (including transitory ischemic attacks), and who had an average age of 76 years, were followed for two years. The purpose of the study was to see how much a stroke, with varying degrees of severity and disablement, affected the long-term situation of the individual. The researchers measured the quality of life of patients when they were first admitted based on ADLs and a structured questionnaire that asked about the individual's "living conditions, psychological situation, relations, and opportunities for meaningful activities" (p.886). Most patients reported a decrease in quality of life after their stroke. The researchers found that there was a high degree of depressive and anxious symptoms after stroke (lowered psychological well-being), and these were associated with a lower quality of life. The authors concluded that psychological factors were just as pronounced in lowering quality of life as physical disablement, and that rehabilitation programs must begin to focus on psychological support for stroke patients.

Burckhardt, Woods, Schultz, and Ziebarth (1989) used the Flanagan Quality of Life Scale (QOLS) to measure the quality of life of 204 adults with either diabetes, ostomy (from colon cancer or colitis), osteoarthritis, or rheumatoid arthritis. They measured the subjects three times over a six week period using the QOLS, open-ended questions, and disease-specific quality of life scales such as the Arthritis Impact Measurement Scale (AIMS) (Meenan, Gertman and Mason, 1980). They found that quality of life did not change over the six week testing period. This author believes, however, that unless a major event has happened in a person's life, quality of life is stable in most individuals, chronically limited or not, over a six week period. If the researchers had administered some sort of intervention within the testing period, they

may have found a difference in their subjects' quality of life.

In conclusion, research appears to show that individuals with chronic physical impairments have a decreased quality of life.

There are very few studies that have been done on self-esteem or self-efficacy of individuals with chronic physical impairments. No articles were found in a ten year search on the Internet. The only studies found were on healthy middle-aged adults and these results will be discussed later in this paper.

### Effects of Exercise on Chronic Physical Impairments

Exercise has the potential to improve an individual's physical health, their quality of life, self-esteem and their self-efficacy. The following section outlines these potential effects, and describes the findings of other studies in these areas.

#### Physical Health

Each of the participants in the Nooners program had some sort of physical impairment that could be improved with exercise. Exercise in the form of rehabilitation has the potential to increase an individual's quality of life by increasing their physical functioning after a chronic impairment has been diagnosed. In this section, the physical effects of exercise will be outlined for each impairment that was discussed in the section on chronic physical impairments. All information in this section, unless otherwise noted, is from Kerson and Kerson (1985).

Stroke. Rehabilitation for stroke serves the purpose of reeducating the brain and preventing the wasting of the unused muscles. It begins within the first month after the stroke with passive range of motion exercises. Active exercises can begin upon indication from the individual's physician. Active exercises use small amounts of resistance to retrain the limbs. Walking is the most important task to relearn, and as many as 80% of post-stroke patients with affected legs can walk again with or without the assistance of a cane or walker.

Rehabilitation in the form of specific exercises also trains the individual for activities of daily living (ADLs) such as dressing, feeding and toileting. These functions are crucial to relearn since an independent lifestyle depends on them.

Heart Disease. If a person survives a heart attack, there is a need for rehabilitation. Even when a person is still in the cardiac care unit of a hospital, passive range of motion exercises are done to the limbs. Early physical mobility is said to be essential to recovery. Since a lack of regular exercise is a risk factor for heart disease, cardiac patients are urged to take part in physician-monitored exercise programs. The Kinsmen Reh-fit Centre has programs for people rehabilitating after a heart attack.

Diabetes. Regular exercise plays a crucial role in diabetes prevention and treatment. Exercise increases glucose tolerance and insulin sensitivity. Because exercising muscles require less insulin than those at rest in order to take glucose into the cells, diabetics who exercise daily generally need less insulin (Ferrini & Ferrini, 1989). Exercise also improves circulation and helps to prevent peripheral vascular disease.

Arthritis and Osteoporosis. Exercise lubricates the joints affected by arthritis, and range of motion exercises reduce stiffness and increase the functioning of the joints. Weight-bearing exercise is critical in the maintenance of bone mass in people with osteoporosis. Exercise also improves muscular strength, and there is a direct relationship between muscular size and bone size (Rosato, 1990).

Multiple Sclerosis. It is agreed upon by medical professionals that exercise is highly beneficial to individuals with MS (Carroll & Dorman, 1993). Exercise has the same effect on this population as with healthy individuals including increased muscle mass, flexibility, cardiovascular and respiratory system improvements, body composition changes and beneficial changes in blood chemistry (Schapiro, 1991). Depending on the severity of symptoms, exercise can maintain and/or improve the body systems affected by MS. For instance, if the individual is dependent on a



wheelchair for mobility, exercise can maintain strength in the upper body to propel the chair.

Head Injury. Preventing musculoskeletal impairments is the main goal during acute care of an individual who has suffered a head injury (Gill-Body & Giorgetti, 1995). The physical therapist will maintain joint health through passive range of motion (ROM) movements. Positioning of patients during bed rest can prevent abnormal joint alignment which will cause pain and the shortening of muscles. Splints or braces can be used to re-align joints into proper position (Gill-Body & Giorgetti, 1995).

Relaxation and ROM exercises must be done to maintain proper tone in the muscles. Stimuli such as tapping or touching the patient can help to facilitate muscle activation and limb movement. For example, a manual cue such as pressure on the hand of an individual while they are seated on the side of the bed will remind them to support themselves with their hands while in this position (Gill-Body & Giorgetti, 1995).

The progression of individuals with head injuries to higher levels of movement begins with rolling and reaching, being prone, movement to sitting, movement while sitting, movement to standing, movement while standing, and finally combination movements and fine motor control (Kovich & Bermann, 1988). Throughout this sequence, simple movement patterns are done to maintain ROM in the joints, and to maintain or improve muscle tone, muscle strength and endurance. Weight-bearing activities will maintain bone integrity. Balance and co-ordination are also a main focus.

Depending on the severity of the head injury, the goal of exercise will be on a continuum from just being able to maintain the individual's basic movement patterns, to a complete restoration of pre-injury activities.

### Quality of Life

It was previously discussed that living with a physical impairment may cause a decrease in the quality of life, self-esteem and self-efficacy of an individual.

Researchers have stated that exercise not only improves physical health, but it helps to relieve stress, anxiety and depression, as well as improve self-esteem and self-efficacy.

Rejeski, Brawley and Shumaker (1996) reviewed several studies that compared the relationship of physical activity to health-related quality of life. They explored the multi-dimensional nature of health-related quality of life, as well as outlined studies that either directly or indirectly supported the positive effect of physical activity on health-related quality of life. They found that, in general, physical activity is associated with improvements in health-related quality of life regardless of age, activity level, or health of subjects including chronically diseased populations.

Stewart, King and Haskell (1993) evaluated quality of life in a group of previously sedentary men and women aged 50-65 years, after a 12 month exercise program. Since the subjects were recruited by phone as a part of a larger survey, no baseline quality of life measures were taken. The subjects were randomly assigned to either a high intensity group training program, a home-based program of high intensity, or a home-based program of low intensity. Physiological measures (max. O<sub>2</sub> uptake, and BMI) were taken at the beginning and end of 12 months. The quality of life measures were only taken at the end of the 12 month physical activity program and were assessed by the MOS Short-Form General Health Survey. Adherence was also monitored through attendance at the group program, and activity logs by the home-based participants. The researchers found that there were no differences in physical or psychological measures as a function of the type of exercise program (home or group), or the intensity of the program (high or low). The authors pointed out that since this was only a post-test study, it cannot be concluded that the exercise caused a

change in physical or psychological health. However, the main factor associated with better-rated physical health was the extent of exercise participation and not the type or intensity of the program.

Emery and Blumenthal (1990) also studied the effect of physical activity on quality of life in older adults, but they used measures of perceived change as well as actual measures of physical, social and psychological health. One hundred and one older adult volunteers ranging in age from 60-83 years were randomly assigned to either an aerobic exercise group, a yoga control group (used to control for cardiovascular benefits), or a waiting list control group. Subjects were tested after a 16 week training period on a perceived change scale as well as two psychological instruments that measured anxiety, depression and affect. The perceived change scale included 19 items covering physical, social and psychological functioning. Subjects were also measured on level of cognitive functioning, as well as level of cardiorespiratory fitness, blood lipids and bone density.

Results indicated that the perceived improvements in cognitive and psychological functioning were larger than the actual measured changes, and that the physical improvements were consistent with actual improvements. As stated before, measures of perceived change must be viewed with caution as some of the psychological improvements may have been due to an increase in self-efficacy or level of adherence. Emery and Blumenthal (1990) plan on measuring subjects' outcome expectations in future experiments to test how reliable measures of perceived change actually are.

So far, the research has not been able to link physical activity to an enhanced quality of life. However, because quality of life is such an all encompassing area of psychological health with so many different dimensions, more of the research has been aimed at how an individual's psychological well-being can be affected by physical activity.

### Self-esteem

There are very few studies on how exercise affects self-esteem in individuals with chronic physical impairments, and a small amount of studies regarding how exercise affects self-esteem in older adults. In general, studies clearly indicate that self-esteem increases in a variety of subjects, including older adults, as a result of exercise programs (Doan & Scherman (1987), Hughes (1984), Folkins & Sime (1981), Leith & Taylor (1989) and Sonstroem (1984).

In an analysis of articles examining physical activity and psychological well-being concepts (Gauvin & Spence, 1996), self-esteem was found to slightly increase as a result of exercise. McAuley, Mihalko & Bane (1997) studied a group of sedentary middle-aged adults and measured their self-esteem before and after a 20 week exercise program. They reported a significant improvement in self-esteem within their subjects. The opposite finding occurred in a study by Brown, Wang, Ward, Ebbeling, Fortlage, Puleo, Benson and Rippe, (1995). They studied 69 women (mean age =  $50.6 \pm 8.0$  yr.) and 66 men (mean age =  $54.8 \pm 8.3$  yr.) randomly assigned to a control group, a low intensity walking group, a moderate intensity walking group, a low intensity plus relaxation group, or a mindful exercise (like Tai Chi) group. They reported no differences between groups on measures of self-esteem.

In conclusion, there seems to be an indication that self-esteem will increase as a result of regular exercise.

### Self-efficacy

Self-efficacy is an important indicator of whether or not an individual will adhere to an exercise program (Sallis et al, 1989). Self-efficacy has not been studied in individuals with chronic physical impairments therefore this discussion will focus mainly on middle-aged to older, healthy adult subjects.

Studies have consistently indicated that individuals with high self-efficacy are more likely to initiate and maintain preventative health behaviours (such as exercise)

(Gecas, 1989). Grembowski, Patrick, Diehr, Durham, Beresford, Kay and Hecht (1993) state that as people age, they are exposed to a variety of personal and social conditions that challenge their sense of control and dependence (ie. experiencing a chronic physical impairment). Older adults will then have less tendency to engage in a health related behaviour (exercise) mainly because of physical decline (Rodin, 1986). The following studies examine the relationship between physical activity and self-efficacy.

Hogan and Santomier (1984) observed an increase in self-efficacy in older adults who participated in a five week swimming class as compared to a control group. McAuley, Bane and Mihalko (1995) had previously sedentary subjects participate in a five month exercise program and found that self-efficacy was increased as a result of both acute and long-term bouts of exercise. McAuley, Lox and Duncan (1993) did a nine month follow-up on a five month structured exercise program with men and women, average age of 54 years. They were interested in the maintenance of exercise participation, self-efficacy and physiological changes that occurred with exercise. They found that self-efficacy was the only variable that significantly predicted adherence to exercise after the nine month period. Self-efficacy scores did, however, decline by the follow-up.

In Gauvin & Spence's (1996) review of the effect of exercise on self-efficacy, they concluded that studies indicated a moderate increase in self-efficacy with participation in exercise programs.

### The Importance of Social Support in Exercise Programs

Social support is a major factor helping individuals with chronic physical impairments cope with their conditions and engage in activities such as exercise to improve their condition. "Social support and social interaction are thought to be among the most important factors in adhering to and enjoying activity programs...".

(O'Brien & Vertinsky, 1991, p.349). Pilisuk, Montgomery, Parks, and Acredolo (1993) interviewed 84 subjects with an average age of 71 years to examine the effects of stress, social support and locus of control on two measures of health: number of actual symptoms and self-ratings of health. They found that support networks could predict the self-rating of health in men, and they concluded that having a social network can build confidence in one's ability to cope with both daily stress, and an illness itself. Cohen, Teresi and Holmes (1985) agree that social networks can promote psychological health. They state that social networks can cause a direct effect on reducing physical symptoms of an illness, but they also reduce the symptoms by "buffering" the effect of stress as it increases.

Participating in an exercise program can provide the social support older adults may need. The presence of social support can promote health (Ferrini & Ferrini, 1989) and may extend the individual's social network (Shephard, 1993). Exercise programs can allow people to meet new friends, get out of the house on a weekly basis, talk to people who have similar problems and promote problem-solving. It also gives people the chance to do something for themselves that makes them feel good on a regular basis.

Kenyon (1968) did some of the first research on why individuals choose to participate in physical activity. He developed a theoretical model that outlined six subdomains to explain the value of physical activity. One of the subdomains was Physical Activity as a Social Experience which states that involvement in some forms of physical activity can meet some of the social needs of certain individuals. Female college students ranked social experience as the second most important reason for participation in physical activity, and males ranked it at number three (Mathes and Battista, 1985). Heitmann (1986) found that older females were motivated to participate in physical activity for social reasons more than older males or any of the younger age groups.

Social support not only helps to get a person started in a program, it also helps them to adhere to the program. Individuals who exercise in a group are less likely to drop out than individuals who exercise alone (Ferrini & Ferrini, 1989). Peer support is also important and is the reason why most people exercise in groups rather than alone (Willis & Campbell, 1992). They concluded that social support, whether it is from family, peers or friends at work is clearly an important factor in exercise persistence.

Barry, Rich & Carlson (1993) explain that for exercise programs to be successful in drawing people to participate and to keep them exercising, they must be enjoyable and must provide socialization. Programs must not only be concerned with health benefits but they should also provide a sense of pride, enthusiasm and excitement for the participants. Verbal and non-verbal reassurance, approval and support by program leaders will increase participation (Willis and Campbell, 1992).

Older adults may not want to exercise for several reasons. Cultural influences, a lack of knowledge about the benefits of fitness and inaccurate beliefs about exercise may act as barriers to participation. Older adults must be educated on the benefits of regular, moderate exercise. It must be pointed out to them that when precautions are taken, vigorous exercise is not risky. They must also be shown that they are more capable than they may believe. Role models are important.

#### Qualitative Research on Chronic Illness and Exercise

The Social Science in Medicine Journal (Vol. 30,(11)-1990) has devoted an entire issue to the topic of qualitative research on chronic illness. Gerhardt (1990) begins with an introductory essay in which she states that sociology needs to adopt an insider's perspective which designates qualitative research "for the purpose of explaining the subjective experiences of living with and in spite of a chronic illness" (p. 1149). Physicians must know the effects their treatments have on patients' daily lives.

The same perspective holds true for the study of exercise as a treatment. With qualitative research, investigators want to know “why” exercise makes people feel better, or relieves their stress, etc. Thomas and Nelson (1990) explain that qualitative research in the area of sport sciences is new, however it has been used in areas such as psychology, sociology and anthropology for years.



## CHAPTER THREE

### METHODS AND PROCEDURES

In this section, a detailed description of the program setting, how the subjects were recruited, subject characteristics, the intervention, a discussion of qualitative methodology, and an explanation of the qualitative measures and psychometric instruments used in the data collection will be provided.

#### Overview of Study

This study used a pre-test/post-test design. Pre-tests were completed before the exercise intervention began, the intervention took place over the subsequent six months, then the post-tests were completed. Both the pre- and post-tests consisted of one-on-one interviews with the subjects and the completion of three psychometric instruments. There were also bi-weekly observations done by the researcher, and two mid-program interviews at two- and four-months into the program. No control group was used in this study.

#### Permission

Permission was obtained from the Board of Directors of the Reh-fit Centre to do the study, and approval was granted from the Human Ethics Committee of the Faculty of Physical Education and Recreation Studies.

#### Setting

The subjects for this study were recruited from a group of participants entering a program called the "Nooners". The "Nooners" is an hour long exercise program for individuals with severe mobility impairments. The class aimed to maintain or improve the physical functioning of these subjects. The program had been running at the Reh-fit Centre for seven years with a core group of participants. Because of the demand for

such a program, another class time was offered and a new group began the program. These new participants formed the convenience sample for the study.

### Recruitment of Subjects

Subject sampling for this research study was purposive rather than random. By purposive, it is meant that individuals are selected from whom the researcher can learn the most (Thomas & Nelson, 1996). In Thomas and Nelson's (1996) book, Goetz and LeCompte (1984) use the term "criterion-based sampling". For this study, the criteria to be met by the subject included being enrolled in the "Nooners" program at the Reh-fit Centre, being over the age of 50 (although one subject was 48), and having at least one chronic physical impairment. To be accepted into the program, the individual had to be able to verbally communicate and be mentally capable.

Subjects were recruited at the Nooners orientation session on September 22, 1994. The researcher took some time to explain the purpose of the study, the methods, the interviews and instruments, and the participants' role in the study. It was made clear to them that they did not have to take part in the study, (although it would be highly appreciated if they did), that they could withdraw at any time, and that they could refuse to answer specific questions that they did not feel comfortable with. The researcher then approached participants individually and asked if they would like to be involved in the study. She stressed the importance of the research. When a participant agreed to participate, the researcher recorded their name and phone number, and scheduled a time and place for the data collection sometime in the next five days before the program would begin on September 27, 1994.

### Characteristics of Subjects

All of the subjects were older adults with at least one chronic physical impairment. The impairments that the participants suffered from included stroke, heart

disease, arthritis, osteoporosis, diabetes, multiple sclerosis, head injury, or a combination of two or more impairments. Refer to Table 1 for a summary of subject characteristics. There were five new participants in the program; one woman and four men. All of the new participants in the program agreed to participate in the study. Four participants had adequate verbal abilities, while one was very difficult to understand. All of them were mentally capable.

Table 1. Characteristics of subjects: age, gender, impairment(s) and date of impairment diagnosis.

<u>Subject Number</u>	<u>Age</u>	<u>Gender</u>	<u>Impairment(s)</u>
1	58	M	stroke.1992
2	80	M	head injury.1994
3	85	F	hip replacement.1990 arthritis/osteoporosis 1983
4	48	M	MS.1981; heart disease.1985. diabetes. 1991
5	56	M	stroke.1993

\*Note: data collection was done in 1994

### Exercise Intervention

The rationale for conducting the Nooners program at the Reh-fit Centre is that hospital-based rehabilitation from chronic impairments is only provided for approximately one month post-event and there is a real need for individuals to remain active to maintain or improve their level of functioning. The purpose of the Nooners program is to provide strength, flexibility and endurance exercises to help individuals improve or maintain this function. In turn, the participants become less dependent on others for daily activities, and their quality of life, self-esteem and self-efficacy will hopefully improve. The program also offers a social outlet with lots of discussion during class as well as the occasional coffee party.

The program ran from 12:15 pm to 1:15 pm every Tuesday and Thursday beginning September 27, 1994. It was led by a staff member and was supervised by a nurse on staff at the Reh-fit Centre. The leader of the Nooners class had taught the class for seven years. She was a Physical Education graduate who had worked at the Reh-fit Centre for ten years. She was friendly, outgoing, and very well liked by the participants and volunteers. The first 30 minutes of each class consisted of some flexibility exercises and some light resistance exercises performed in a chair. For the the second 30 minutes, the participants did cardiovascular activities such as walking around the track, using the cycle or arm ergometers, or rowing on the rowing machines on their own or with the volunteers.

Most participants worked with a volunteer so that if they could not lift their paralyzed arm, for instance, the volunteer would place the arm in the position to stretch the muscles. The volunteer also assisted the participant in the cardiovascular portion of the class such as offering an arm when walking on the track. Volunteers were often the spouses of the participants, or they were other members of the Reh-fit Centre. Participants kept track of the number of laps they would walk or how many minutes they would spend on the ergometer or rowing machine.

Before the classes began in September, each participant was assessed by a rehabilitation physician. The physician took blood samples, a resting EKG, and some range of motion and strength assessments. The physician reported the specific areas that the participant needed to work on to the instructor who individualized each participant's program to some degree. The instructor then met with the participant and their volunteer, and educated them on specific exercises that they should focus on in the class, and work on at home.

#### Description of Qualitative Methodology

Qualitative research "seeks to understand the meaning of an experience to the

participants in a particular setting...” (Thomas & Nelson, 1996, p. 367). Two different qualitative methods were used in this study - the interview and observation of the exercise class. The following is an explanation of the benefits of qualitative research, a discussion of internal and external validity and reliability, and guidelines for interviewing and participant observation.

There are three main objectives in qualitative research: description, understanding and meaning (Thomas & Nelson, 1996). The researcher is the primary tool for data collection (Thomas & Nelson, 1996) either as an interviewer, as the author of the questionnaire, or as the observer in a naturalistic inquiry. In this study, the researcher interviewed and observed the subjects.

One of the major drawbacks of using qualitative research is that validity and reliability are difficult to establish. Thomas and Nelson (1996) outline several methods that improve the level of validity and reliability in qualitative studies.

#### Internal Validity

Internal validity is the extent to which the results of a study can be attributed to the treatments used in the study (Thomas & Nelson, 1996). Merriam (1988) in Thomas and Nelson (1996), lists six strategies to ensure internal validity:

1. triangulation of data - use more than one form of data collection and compare the results
2. do plausibility checks of the data collection and interpretation by taking the data back to the subjects
3. long term data collection or repeated observations
4. peer examination and evaluation of research findings
5. involve the participants in all phases of the research
6. clarify the researcher's own bias and theoretical orientation at the outset of the study.

### External Validity

External validity is defined by Thomas and Nelson (1996) as the generalizability of the results of a study to the population as a whole. In the typical qualitative study, external validity is questioned because of the relatively small, non-random samples. There is a new notion of “user generalizability” (Thomas and Nelson, 1996) where the reader of qualitative studies can evaluate the findings of a study, and apply them to similar situations that they are familiar with. This is called “transferability” and it is considered a way of improving external validity.

### Reliability

If a study is repeated using the same methods and procedures, and the conclusions are similar to the past study, it is said to be a reliable study. Thomas and Nelson (1996) state that there are two ways of reducing threats to reliability in qualitative studies - by using a mechanical recording device and rich description, and by using inter-observer agreement. It was not feasible to evaluate the issue of inter-observer reliability in this study since there was only one researcher, however, the interviews were tape recorded.

External reliability determines to what degree a study can be repeated. It is suggested that clear descriptions of the following criteria help to achieve external reliability of qualitative data: 1) participants and why they were chosen; 2) the role of the researcher; 3) environment or setting; 4) data collection methods; and 5) how the data will be analyzed (Thomas & Nelson, 1996). Each of these criteria were fulfilled during the study.

### Guidelines for Interviewing

Several different interviews were conducted in the present study. Subjects were interviewed before the intervention, there were two short mid-program interviews during the intervention, and subjects were interviewed after the intervention. As well, the program leader was interviewed pre- and post-intervention.

Gorden (1980) states that interviewing is the most valuable form of qualitative data collection. It is imperative to use when researchers want to know a person's beliefs, attitudes, values, knowledge, or any other subjective orientation. It is a two-way exchange of information where the interviewer must foster and motivate the respondent to give relevant information.

As a qualitative method of data collection, the interview has several advantages over the questionnaire. First, it is adaptable - questions can be reworded or rephrased for clarification. Second, interviews are versatile with regards to the personality and receptiveness of the respondent. This is to say that the interview can be conducted as rigid, emotionless and straight to the point, or it can be held as a relaxed, conversation-type interaction, depending on the characteristics of the respondent. Third, the interviewer can observe *how* the respondent answers a question and achieve more of an insight into the respondent's feelings about a question. Fourth, there is a higher rate of return for interview. People find it harder to reject a real person than a piece of paper (Thomas & Nelson, 1996). One last advantage of the interview over the questionnaire is that the interviewer can probe the respondent for more detail in their answers (Thomas & Nelson, 1996). Gorden (1980) agrees with these advantages of interviewing over the use of questionnaires, and adds that interviews provide accurate and complete information immediately.

Thomas and Nelson (1996) consider interviews more valid and reliable than questionnaires. However, one main source of interviewing invalidity is when an interviewer improves their technique over time. Gorden (1980) suggests allowing another researcher familiar with the study topic to code the responses so that the interviewer does not read anything into the material. This is possible because the interviewer may consider the non-verbal information that was present during the interview. This researcher thinks that the non-verbal communication is worth noting considering it may reflect more accurate feelings of the respondent than their verbal

responses.

### Characteristics of the Interviewer

The personal characteristics of the interviewer can make or break an interview situation. The interviewer should dress appropriately in order to convey an impression of confidence, but appearance should also be suitable for the setting to remain unobtrusive (Molyneaux & Lane, 1982). The researcher must gain rapport with the respondent to make them feel more comfortable, and to trust the interviewer, and to make the respondent want to talk to the interviewer (Thomas & Nelson, 1996). Rapport is gained by spending some time getting to know the respondent before the interview.

The vocabulary used by the interviewer must be appropriate for the respondent. The use of slang or sophisticated terminology should be avoided as it can cause confusion to the respondent (Gorden, 1980; Molyneaux & Lane, 1982). The interviewer should be familiar enough with interviewing techniques to be able to rephrase or reword questions, and ask questions that permit the respondent to speak freely. They should be alert to non-verbal messages (Thomas & Nelson, 1996; Gorden, 1980).

The way an interviewer responds to the information they are receiving is also very important for getting the most valid answers. For instance, the interviewer should not show his/her own values when interviewing, they should have a non-judgemental attitude, and they should show sincere interest in the information (Gorden, 1980). However, the interviewer must balance these issues with a concern for receiving precise facts, and should maintain a critical or evaluative stance in regards to the information (Gorden, 1980). The interviewer must remember that the respondent is a person too, and that they are providing a service crucial to their study. The interviewer may appear insensitive or uncaring if they forget responses or do not probe into answers that warrant probing. The interviewer should never use a condescending



tone, or be overly concerned with not offending the respondent (Gorden, 1980).

Finally, the interviewer should realize the respondent's need for appreciation and recognition both during and after the interview. The interviewer should strive to make the respondents leave the interview content that they could have been of service, and glad to have helped.

### Characteristics of the Interview

Besides the characteristics of the interviewer, the characteristics of the interview itself are important to the validity of the answers given by the respondent. Little research has been done on how the setting affects the interview, but settings should be comfortable, and free of auditory and visual distractions (Gorden, 1980).

The use of tape recording devices are helpful in that they are unobtrusive compared to note-taking which can be very distracting for both the interviewer and the respondent. The interviewer may not be able to listen attentively and write at the same time, and the respondent may feel neglected because there is no eye contact being made (Gorden, 1980). The advantages to tape recording interviews are that it obtains complete and accurate details of the interview, it affords optimal inter-personal relationships, and it make data analysis more efficient (Gorden, 1980). The major downfall of recording interviews is that it can take anywhere from three to twelve hours to transcribe a one hour interview. Gorden (1980) summarizes that "the less sure we are of what categories of information are relevant to the problem, the better it is to use a tape recorder" (p. 225). He also suggests that the interview should be transcribed by the interviewer, that it should be done as soon as possible after the interview has been completed (so that subsequent interviews can benefit), and the interview should be transcribed in the order of the questioning.

The opening question of the interview should relate directly to the purpose of the study, it should be easy to answer, and subsequent questions should flow systematically with the use of lead-in statements before each new topic is introduced

(Gorden, 1980). In each section, questions should follow the “funnel sequence” (Gorden, 1980) where the most broad questions are asked first, and each subsequent question is more specific than the one prior.

#### Guidelines for Participant Observation

The aim of participant observation research is to describe a setting, the activities, the participants, the meaning of the setting and how the activities impact on the participants (Patton, 1980). It allows the observer to get close enough to a phenomenon in order to understand it in a direct and personal fashion (Patton, 1980).

According to Patton (1980), the benefits of doing observational research are:

1. it allows the observer to better understand the context within which a program operates;
2. it allows the observer to be inductive by directly experiencing the program unto itself therefore allowing a discovery-oriented approach;
3. the observer has the opportunity to see things that may routinely escape conscious awareness among participants and staff;
4. the observer can learn things that participants/staff may be unwilling to talk about during an interview;
5. the observer is allowed to move beyond the selective perceptions of others; and
6. understanding a program through firsthand experience permits the evaluator to access personal knowledge and direct experience as resources to aid in understanding and interpreting the program being evaluated (Patton, 1980).

Patton (1980) and Palys (1992) agree that the observer can take on four possible roles. These roles exist on a continuum from “complete participant” in the program to “complete observer” of the program with the two middle roles being “participant as observer” and “observer as participant”. In the present study, the observer was a “participant as observer” meaning that there was some interaction between the subjects and the observer, and the participants knew that they were being

observed.

The observer must be sure to decrease as many factors that may cause reactivity as possible. For instance, the observer should not be conspicuous when taking notes. They should move to an unobtrusive area off to the side of the program to write their notes. The observer should not look out of place by wearing the obvious white lab coat, but should dress conservatively and professionally. Finally, there should be a clear reason provided to participants as to why they are being observed. If the researcher is unobtrusive and professional, and the participants know why they are being observed, the observer should not experience a high degree of reactivity.

Patton (1980) outlines several things that should be observed when doing participant observation research. First, the program setting should be noted. This includes a physical description of the environment that is detailed enough to allow a reader to visualize it. Second, the participants and the social environment should be observed. We want to know who the participants are and how they react to one another within this social context. Third, the program activities and participant behaviours are to be observed. What do people do in this program? What is it like to be a participant in this program? Fourth, the observer should be looking for informal interactions and unplanned activities. As Patton (1980) explains it is impossible to anticipate what kinds of things might emerge during observation of unplanned activity time. Lastly, the observer should look for non-verbal communication. Facial expressions, fidgeting, how a person presents themselves, or how they communicate are all cues to how they exist within the program setting.

Field notes are essential in any observational setting. They should specify the time and place of observation, the people present, spacial distribution of participants, the interaction of participants, and any details of interest. The observer should feel free to insert their own comments and speculations about what is occurring into the notes (Palys, 1992).

Patton (1980) and Palys (1992) agree that observation, although a very useful form of data collection, is not usually used alone. It is commonly combined with other forms of data collection, especially self-report. This allows the researcher to compare what subjects say to what they actually do.

### Qualitative Measures Used in Study

#### Interviews

The questions in each interview were designed according to the interview method outlined in Gorden (1980) in terms of structuring and sequencing. This study used a standardized, scheduled interview where the questions were specified in advance and asked in the same order for all respondents. Gorden (1980) explains that scheduled interviews provide an aspect of "topic control" so that the interviewer dictates the line of questioning and does not allow the respondent to stray off topic. Having a large degree of topic control is beneficial when respondents are apt to ramble on, and also when there is a time constraint for the interview. Questions were constructed to cover certain areas that are listed in the Interview Checklist (Appendix A). There were two different long interviews: one for pre-intervention (Appendix B), and one for post-intervention (Appendix C). As well, two shorter mid-program interviews were conducted at the two- and four-month mark within the data collection period (Appendix D). All interviews were recorded on audio tapes with consent of the subjects.

Interviews were also held with the leader of the class. These interviews were done after two months and at the end of the six-month intervention. She was asked to comment on the physical, emotional and social changes she observed in each of the subjects.

#### Observations

Twice-monthly class observations were made by the researcher including notes

as to the subjects' social interaction, their effort and attitude towards the exercises, whether there were any physical changes, and the overall atmosphere of the class and its participants.

### Psychometric Instruments

Several instruments were used to measure changes in quality of life, self-esteem and self-efficacy including the Medical Outcomes Study Short-form General Health Survey, Rosenberg's Self-esteem scale, and Sallis' Self-efficacy scale.

#### The Medical Outcomes Study (MOS) Short-form General Health Survey

The MOS (Stewart, Hays & Ware, 1988) was used to measure quality of life. It was developed due to a need for a short, simple and easy-to-use method for measuring patient outcome in clinical settings (see Appendix E). The rationale was that patients are usually sicker and have shorter attention spans than the general public, so a compromise between a lengthy instrument and a single-item quality of life measurement was sought (Stewart et al, 1989).

The MOS consists of twenty items representing six health concepts: physical, psychological, social and role functioning, health perceptions and pain. This instrument was selected because the six categories represent the study definition of quality of life. Details of each subscale are presented in Table 2.

Items are measured on three, five or six point Likert scales. For example, the psychological functioning items ask "How much of the time.....", and responses range from "All of the Time" (1) to "None of the Time" (6). Higher scores indicate higher functioning (therefore higher quality of life), with the exception of the pain item where a high score indicates more pain (Stewart et al, 1989). This item is reversed when data is analyzed. Stewart, Hays & Ware (1988) found the scale to be valid and reliable with reliability coefficients ranging from 0.81 to 0.88. Correlations among the health measures were all statistically significant ( $p < 0.01$ ). Stewart et al (1989) also found that this measure was valid and reliable, and they noted that several other authors agreed.

Table 2. Definitions of Health Concepts of the MOS

Measure	No of Items	Definition	Item Numbers	Total Score Possible
Physical Functioning	6	Extent to which health interferes with a variety of activities (sports, walking, carrying groceries)	3a-f	18
Role Functioning	2	Extent to which health interferes with usual daily activities (housework, work, school)	4,5	6
Social Functioning	1	Extent to which health interferes with normal social activities (visiting friends in past month)	6	6
Psychological Functioning	5	General mood or affect, including depression anxiety and psychologic well-being	7-11	30
Health Perceptions	5	Overall ratings of current health in general	1,12a-d	25
Pain	1	Extent of bodily pain in past four weeks	2	5

Self-Esteem Scale

Rosenberg's (1965) ten-item Guttman scale was used to measure self-esteem (see Appendix F). It is short and easy to administer which is important to this study. Being a Guttman scale, the inventory ranks people along a single continuum ranging from those who have very high to those who have very low self-esteem.

The ten items have been divided into six scales based on the Guttman scaling technique. Thus, each subject receives a self-esteem score between 0 and 6, depending on the number of scales for which they receive positive scores. Positive scores indicate low self-esteem.

There are two ways of measuring the reliability of a Guttman scale: reproducibility and scalability. Rosenberg (1965) reported the reproducibility of his scale as 92%. Scalability "ensures a uni-dimensional continuum by establishing a pattern which must be satisfied before the scale can be accepted" (Rosenberg, 1965,

p.16). The coefficient of scalability was 72% as reported by Rosenberg (1965) which is satisfactory for the criteria of Guttman scaling. Evidence suggests that this scale is suitable for use with older adults (Bowling, 1991) and is highly recommended by George and Bearon (1980). Robinson and Shaver (1973) as cited in Bowling (1991) found that this scale correlated 0.59-0.60 with Cooper-Smith Self-esteem Inventory. Convergent validity was assessed and item correlations of 0.56 and 0.83 were reported (Bowling, 1991).

### Self-Efficacy Scale

Self-efficacy has been found to be highly related to participation in physical activity (Sallis et al, 1989). To determine the association between social learning theory variables and self-reported vigorous exercise with a sample of 2053 respondents, Sallis et al (1989) designed a self-efficacy scale for use in a study. They found that self-efficacy had one of the highest correlations with self-reported vigorous exercise as compared with 23 other social learning theory variables.

This scale was used in this study because it is short (4 items) and easy to administer (see Appendix G). The responses are on a 5-point Likert Scale ranging from "Know I cannot" to "Know I can". Scores range from 4 to 20, with 4= low self-efficacy and 20 = high self-efficacy.

### Data Collection

The pre- and post-test data collection sessions were scheduled at the most convenient time and place for the respondent, typically in their homes. One subject was interviewed at the Reh-fit Centre (pre-test) and at work (post-test). At the beginning of each session, the respondent was required to sign a consent form (Appendix H). They were reassured that all of the information exchanged in the session would be kept strictly confidential.

The psychometric instruments were, in most cases, administered first since they

took a larger degree of concentration. They were self-administered with the researcher clarifying any questions that were not understood. For three of the subjects, the researcher had to read out some of the instrument questions and the possible responses, because the respondents were not comprehending.

Once the instruments had been completed, the interview was introduced (Appendix I). The researcher aimed to keep it to under one hour. The interview was recorded with an audio recording device. It consisted of a list of preplanned questions. No one else was present to distract the respondent or keep them from giving valid answers. At the end of the interview, the respondents were thanked for their time, told that the researcher would see them at the program, and that there would be another formal interview in six months.

There were two mid-program interviews with each subject that took place informally during the class at the two- and four-month stages.

The post-intervention interviews took the same form as the pre-intervention interviews. The researcher visited the class in the first week of March, 1995 and set up times and places for the second meeting. Some subjects had to be phoned because they were not present on that day. The same psychometric instruments were administered in the same format. The post-intervention interview also contained preplanned questions.

## Analysis of Data

### Analysis of Interview Data

All interviews were transcribed verbatim from the audio tapes. These transcriptions, including the leader interviews, were read and re-read several times and labelled in the margins as themes began to emerge. Themes were listed on a separate piece of paper, condensed if there was overlap, and defined. Finally, the themes were triangulated with the leader's observations, and quotes from the



subject's interview data were pulled from the transcriptions to support each theme.

#### Analysis of Observation Data.

Observations of the program were done twice a month. The researcher sat on the podium, an elevated desk area situated near the class, and observed the social interaction, emotional state, and the physical changes in each subject. Observations were recorded in a notebook. Each participant was assigned a colour code for ease in grouping notes on subjects together. The observation data were then read and observations about each subject were highlighted according to their assigned colour. Excerpts in each colour were cut out, pasted, and dated so that each subject's excerpts were together. This was a simple method of organizing field notes that were scribbled down and not organized since the researcher was trying to catch behaviours of all five subjects at once.

At the end of the study, the notebook was photocopied, and each subject's comments were cut and pasted together chronologically so that each subject had an individual booklet. Because the data were being combined into a case-study format, it was simpler to have each subject's data together. As the subject's notes were read and re-read, comments were written in the margins, again relating to possible themes and subthemes.

After both the interview and observation data were analysed, and certain themes emerged, the themes were condensed and combined, and then defined. Quotations from the subject interviews were added to support each theme. The researcher used triangulation when analyzing the data. Triangulation is the process of supplementing one type of data collection with another for verification, further detail, or for aiding the interpretation of the data (Gorden, 1980). The interview data, the observation data and the psychometric instrument scores were compared against each other to verify the participants responses with their actions. Thomas and Nelson (1996) state that "between method triangulation is a means to establish both

validity and reliability" (p. 332) but it is possible to introduce bias through triangulation by searching for any hint of the same response in the second form of measurement. If the two methods of measurement have correlating results, concurrent validity can be established.

Because there was only one researcher involved in the data collection, it was necessary to have different types of data available for triangulation. What the researcher observed during the class observations (for example, sociability or physical improvements) was compared to the information the leader of the class gave during her interviews. Observation data were also compared to the participants' interview answers and instrument responses.

#### Analysis of the Psychometric Instruments.

The six MOS subscales were scored by summing the item responses. Some scores were reversed so that a high value would indicate better functioning. Subscale scores were totalled and this total indicated the quality of life score. Higher scores indicated a higher quality of life.

The Self-esteem scale is a Guttman scale. Table 3 outlines the item numbers that make up each scale. For example, Scale One combines the responses from questions 3, 7 and 9. If the subject answers 2 out of 3 or 3 out of 3 positively, they would receive a "positive" score for Scale Item One. Positive scores indicate low self-esteem.

Table 3. Self-esteem scale numbers and corresponding item number(s).

<b>Scale</b>	<b>Item number(s)</b>
1	3,7,9
2	4,5
3	10
4	1
5	8
6	2,6

---

The Self-efficacy scale scores were totalled to give a total self-efficacy score between 4 and 20 with 4 = low self-efficacy and 20 = high self-efficacy.

Pre-test scores for each scale were visually compared to the same subject's post-test scores. Because of the small number of subjects, no inferential statistics were completed.

## CHAPTER FOUR

### RESULTS

This chapter will include observations of the facility and the exercise program content, as well as a description of the social aspects of the class. Each subject is then described by case study in terms of their demographics, health and background in physical activity, their participation in the program, perceived benefits and an evaluation of the program. The case studies were developed from the results of the interview and observation data. The observer's comments and the leader's comments are included at the end of each subject's case study. Next, the seven themes that emerged from the observation and interview data are defined and explained. The last part of the chapter outlines the results of the psychometric instruments, and an explanation for these results.

#### Observations of the Facility and Exercise Program

##### Facility

Figure 1 presents a diagram of the Reh-fit Centre fieldhouse where the classes took place. Some of the Nooners participants could not access stairs because they used wheelchairs, so they entered through a multi-purpose room on the main floor. Other members had to go upstairs to use the change facilities and then travel down a staircase into the fieldhouse. As they entered, on their right were six rowing machines. To the left is the office of the Executive Director of the Centre, then the Emergency Room, the Lab where stress tests are taken and on the far left are the staff offices. The Nooners had to cross the track that circled the whole fieldhouse to the area in front of the staff desk, or "podium" where their exercises were done. The podium is a five foot high by ten foot long structure where the staff would sit and complete paperwork, and it was also used to store equipment. The cafeteria, offices of the dietitian and massage

therapist, and classrooms are located on the mezzanine level. Directly in front of the podium was where the Nooners circle of chairs were set up for their class.

Stepping machines, two rows of bicycle ergometers and the resistance training equipment which included free weights and benches, Nautilus equipment and Cybex machines were also located in the fieldhouse. The very centre of the fieldhouse was dominated by a hardwood floor that held three volleyball courts or five badminton courts. This area was surrounded by a net that reached almost to the height of the ceiling. This hardwood area also served as the aerobics and line-dancing floor.

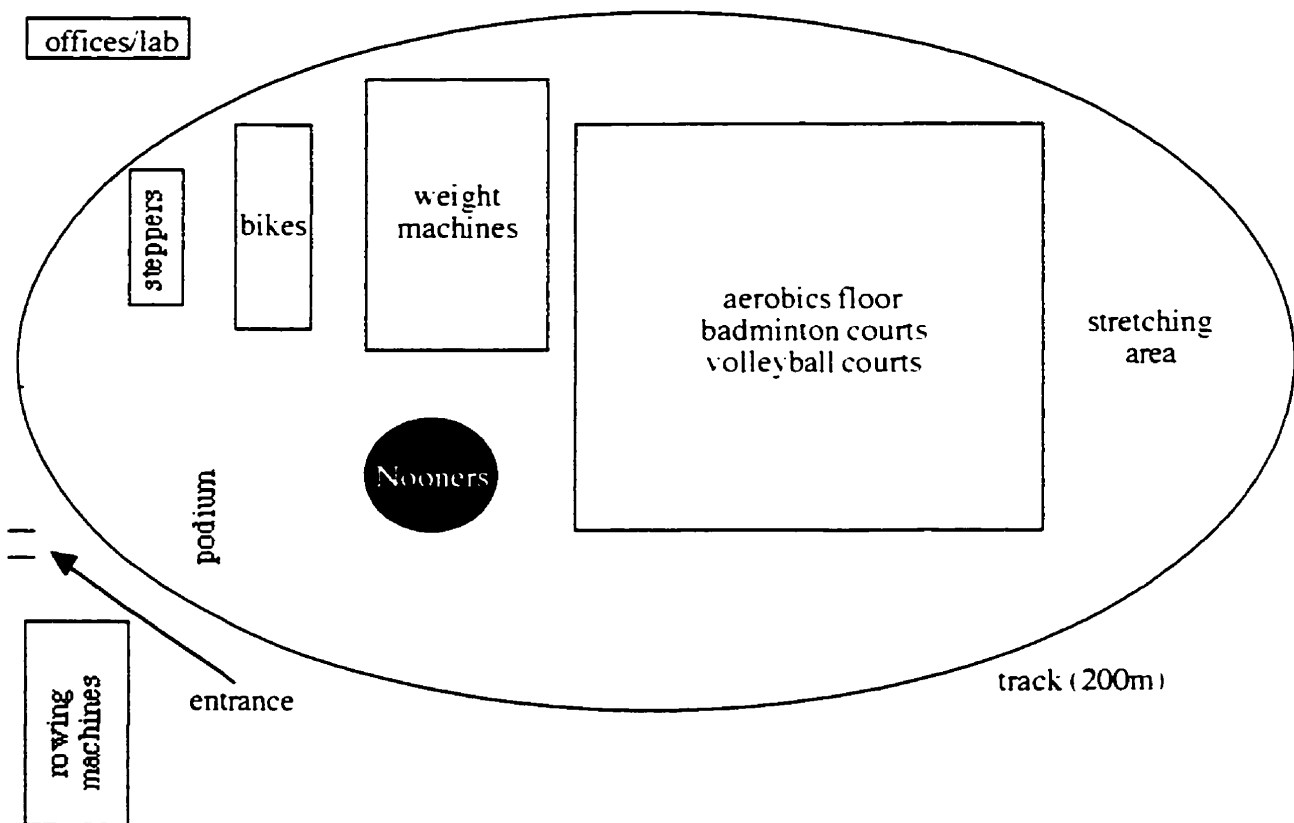


Figure 1. Kinsmen Reh-fit Centre fieldhouse

At the far end of the fieldhouse was a carpeted area where stretching classes and Tai Chi were held. There was another stretch area with a barre in the southwest corner of the building. Usually there was faint music coming from the overhead

speakers, every type of music from rock to jazz to waltzes. During the Tuesday Nooners there was a line dancing class held simultaneously on the hardwood floor and the country music was heard throughout the fieldhouse. The lighting was fluorescent and not too bright. The fieldhouse was mostly painted white and dark green with the south wall having a mural of a forest covering it.

The fieldhouse was kept at a cool temperature for the comfort of the people who were exercising. A few of the Nooners participants found that the fieldhouse was too cold for the activity they were doing.

The fieldhouse was generally quiet during the time of day that the Nooners program was held, which cut down on distractions, and participants were better able to focus on the leader. During the 11:00 am class, there were approximately 40 other members and five staff in the fieldhouse. This number always decreased to about 15 members by 12:30 pm. Most of the members in the fieldhouse at these times were seniors who walked around the track.

### Exercise Program

The class consisted of a five minute chair warm-up of marching legs, swinging the arms, and other gross motor movements. Next, all the muscle groups were stretched beginning with large muscles in the upper body including the chest and back, and moving down to the wrists and even fingers. The leg stretches were performed from a seated position beginning with the quadriceps and hamstrings, and working down to the ankles and toes.

The resistance exercises progressed from the participant using their own body weight to using one to three pound dumbbells or weighted tennis balls by the third month of the program. Exercises such as the shoulder press, front shoulder raise, bicep curl and tricep extension were done for the upper body. Following these were leg extensions, and hip abductions and adductions using manual resistance provided by either the participant themselves, or the volunteer. The group would then stand up

and sit down in their chairs ten times to improve quadricep strength. They would remain standing and move to a position behind their chairs for other leg exercises. Volunteers would sit in the chairs to weigh them down. While in this position, participants performed squats, hamstring curls, knee raises and hip extensions. One set of 10-12 repetitions was performed for each exercise.

The group session ended with two deep breaths. The first portion of the class took approximately 40 minutes. The participants were then expected to do their own cardiovascular endurance exercises for the last 20 minutes of the class time. Many chose to walk around the track. Others rode the bicycles, used the arm ergometer, or a combination. The leader and volunteers accompanied the participants for safety and company during this time. Most Nooners walked between one and four laps of the 200 metre track, and some even came early to do a few laps before class. They were urged to rest if required and to drink water periodically.

### Social Aspects

Throughout the Nooners class the leader encouraged interaction, and many participants told stories and jokes. In the 12:15 pm class, one subject always had a "joke of the day". Many of the conversations centred around the weather, holidays, families and grandchildren.

Once every two months, the leader would hold a special coffee party for the participants from both classes. Everyone would arrive at the centre at 11:30 am in the Multi-purpose Room and had a cup of tea or coffee and some goodies. For some parties, the Nooners were asked to bring something to share such as veggies and dip or dainties. After about 45 minutes of visiting and eating, everyone would go out to the fieldhouse for a 30 minute class of mostly stretching. Some participants would still choose to do laps of the track, but it was considered an easy workout day. The parties fell on Hallowe'en, Christmas and Valentine's Day during the time of the data

collection. These parties were an effective way of letting participants find out about each other, do some problem-solving with others who had similar impairments, and it gave the participants something to talk about when they were in the class.

### Case Studies of Five Subjects

A case study was done for each of the five subjects. Data were included from all of the interviews with the subjects and the program leader. These included the pre-intervention interview in September, the mid-program interviews in November and January, and the post-intervention interview in March. The observation information was also used for the case study development. The subject's demographics, health and background in physical activity, their participation in the program, the perceived benefits of the program and their evaluation of the program are outlined. The observer's comments and the leader's comments are included at the end of each case study.

#### Subject One

Demographics. Subject I was a 58 year old male. He was a retired railway worker who was divorced and living in his home with his dog. He had a daughter, and a brother and sister-in-law who lived in the city. His parents were still alive and also living close by. The highest level of education that he obtained was Grade 12 plus some training with the Canadian National Railway where he worked as a car inspector and a crane operator. Subject I was six feet tall and weighed approximately 250 lbs.

Health and Background in Physical Activity. Subject I had a stroke on October 16, 1992 which paralyzed the entire left side of his body. He was given a wheelchair when he left the hospital, but he vowed never to use it and at that time he was barely able to walk with the help of a cane. His left leg in his words "is a little floppy sometimes" and he had very little strength in his left hand. He was gaining back some strength in his left limbs at the time of the initial interview. He had gained a lot of



weight since his stroke and was very concerned about losing at least 20 lbs. He also had had surgery for cataracts one and a half months prior to the beginning of the study.

When the stroke occurred, he initially denied it. He lay on the floor and thought that this couldn't be happening to him, but having been trained in First Aid he knew that he was having a stroke. He spent the first ten days at the Victoria Hospital and was then transferred to the Rehabilitation Hospital for three and a half months. Once he returned home, things were "terrible". He was unable to cook for himself or do his own laundry or cleaning and he depended on Home Care for these and other household duties.

He had a lot of social support from his daughter and his neighbours while recovering from the stroke and he found this support very satisfactory. For example, his neighbour would make sure the back lane behind his garage was shovelled so he could get his truck in and out during the winter months. He also received support from his brother and sister-in-law. He had two "buddies" who still called him and they would occasionally go out for coffee at the local mall.

The only other therapy or program he was involved in besides the Nooners program was his own home exercise regimen. He had a stationary bike and a rowing machine that he used almost every day (unless he felt sick) for 30 minutes to one hour. He would ride for about two minutes, rest for two minutes, ride, rest etc. while he watched television. He was not involved in physiotherapy or anything else after his stay at the Rehabilitation Hospital.

As for his past involvement in physical activity, he used to curl, fish and garden. He continued gardening after his stroke and made special note of the huge tomatoes he was able to grow in his own back yard. When he was a bit younger, he was very involved in hockey and baseball. He liked to be busy and always had a project such as redoing his basement or taking care of his vegetables.

His attitude towards physical activity was difficult to discern because he didn't quite grasp the question, but he said "I think most people want to do something; bowl, or curl or play baseball". He believed that society generally thinks physical activity is a good thing. In the final interview, Subject I was more enthusiastic about physical activity. He agreed that physical activity was beneficial to an individual's health because he himself could "do a lot more now" after being a part of the Nooners program.

Participation in Program. When Subject I's stay at the Rehabilitation Hospital was over, the social worker gave him a list of places to call about exercise programs and other resources he might need for living with his stroke. The Reh-fit Centre was one of the places he called, but initially he was told that there was no program available for people who had had strokes. He was placed on a waiting list, and when the second class was started, he was called and invited to become a member of the Nooners. He had not done any exercise in the year between when he was placed on the waiting list to the time when he started the program.

Initially he committed to go to every class of the program. He only ended up missing one when he was sent home by a nurse at the Reh-fit Centre because he looked pale. He was not very happy about this because he really wanted to stay and exercise. He thought that he may have had to take Handi-transit to the program during the winter rather than drive, but this did not occur - he always drove his own truck to the class. The only other barrier he thought might get in his way of attending the class was a conflicting visit from Home Care at the same time as the class. Since Home Care only came once a week, he couldn't afford to miss their visit. Fortunately, there was never a conflict with Home Care during the six month study period.

Perceived Benefits of Program. His goals for the program were to lose some weight, strengthen his left arm, and improve his co-ordination. The benefits that he perceived to have experienced between September, 1994 and April 1995 were huge

improvements in left arm strength and flexibility, and increased strength and flexibility in his left leg. He already had noticed an improvement in his flexibility, increased strength in his left arm and leg, and the ability to walk longer when he was interviewed in November. He also said that his knees ached but they improved as they warmed up, and he blamed the sore knees on the extra weight he was carrying. He admitted he slept better and had more energy on some days. His grip strength had increased from where he could not hold on to a one pound weight in September to being able to hold on to the weight in February. He attributed this to squeezing an exercise sponge every day while he watched television. He also noticed that his shoulder flexibility improved to the point that he was able to lift his hand above shoulder height compared to only waist height before the program: "I can put my arm over my head. I couldn't even lift it like this (waist height) when I started". His cardiovascular endurance increased as well. He began in September by walking two laps after class to working his way up to an average of five, and as many as seven laps that were completed before and after class. In the final interview, when asked whether there were any benefits he had expected to see that hadn't occurred yet, he replied that he wanted to walk and run and have some strength. He had not been able to run, but had made significant strides in the other two areas. He attributed his physical improvements to being a member of the Nooners class but he was worried that he would improve too much and lose his Home Care.

Emotionally, Subject I was always in a good mood during the class. When he was initially interviewed, he appeared to get a bit depressed or sad when we talked about his impairment and his social support. In the final interview, he felt that he had changed quite a bit. He said that previously he "couldn't watch TV. I, uh, I'd break out crying, you know, just for nothing. And that's changed quite a bit". He was very motivated to improve his physical condition and to lose weight, and he worked very hard in each class. He compared his class which was held at 12:45 pm to the earlier

Nooners group that started at 11:30 am and concluded that his class was better because there were participants in the earlier class that didn't try; they didn't do the exercises with any effort. He talked about one man in particular: "...he won't do nothing. Sits there. I don't know why he goes. I'd send him home 'cause he's not doing any good".

He was the most sociable participant in the class. He arrived early to visit with the participants in the first class. "Nothing to do at home. Might as well come here to talk to people". He really enjoyed the coffee parties that the leader held every two months for a treat and especially appreciated the fact that the leader made a pot of tea for him when all of the others had coffee. He used the class as a twice-weekly outing not only to work on his exercises, but also for socialization. He really enjoyed the group setting compared to the one-on-one exercises that he had been involved in at the Rehabilitation Hospital.

The program also made some improvements in how effectively or efficiently he could carry out his activities of daily living. In September he talked about having trouble cooking or using his tools because his hand "bounced". He would burn and bruise himself constantly. He would get tangled in his sheets at night because he didn't have the co-ordination to roll over without getting the sheets wrapped around himself, and he would therefore not get a good night's sleep. Since his left leg dragged when he walked, he would get tripped up in his yard if the grass got too long. After the six month data collection period, he was asked if these activities got any easier for him. He said that he found it easier to get up and down his basement steps, and it was easier to carry groceries. The biggest difference in his daily activities since September was that "I exercise a lot more than I used to". He still found cooking, shaving and Toiletries difficult because they all required small precise hand movements which were improving but not sufficiently.

In the initial September interview, Subject I couldn't think of anything that had

affected his quality of life in the previous three months. In the final interview, he was asked how the Nooners program had changed his quality of life and his response was "Yeah. For one thing, I get out for a couple of hours a week or whatever. And um, talk to different people...".

Evaluation of Nooners Program. Subject I enjoyed the Nooners program very much. He liked all of the different exercises and being able to walk inside on the track instead of outside on the uneven sidewalk. He also thought the staff and volunteers were good. He never forgot to bring the leader a Werther's candy to every class. The Nooners had a different leader for a few weeks but Subject I didn't like this new leader as much because "we can talk him into doing the easy things". When I spoke to him in the November mid-program interview, I asked if there was anything he didn't like about the class and he told me he found it difficult to keep up. He was a bit awkward and once he got his body into the starting position for a stretch (ie. one leg crossed over the other), the leader would have already moved on to the next stretch. The only other dislike Subject I had was the fact that members had to change their shoes when they came into the centre so that no dirt was tracked into the fieldhouse. It would take him half an hour to get his shoes on at home so he didn't want to go through it again before the class. Instead of changing his shoes, he just stood in the hall and stamped his feet until the snow or wet dried up.

He liked the atmosphere of the centre especially on Tuesdays when the country line-dancing class was on at the same time as the Nooners. He really enjoyed the loud country music that they played much more so than the rock and roll, and aerobics music that usually played throughout the fieldhouse.

Subject I thought the class needed more volunteers because there was one participant that the leader or another participant's volunteer always had to go over and help with some of the exercises. Subject I thought this man needed his own volunteer. The volunteers that were there helping with the class were very friendly, and one in

particular would always go over and sit beside him and talk before class.

His family and friends supported his decision to join the Nooners program and his sister-in-law told him she thought going to the program was the best thing he could be doing for himself. In the November mid-program interview, Subject I stated that his friends thought it was a "real good idea" for him to be taking part in this type of program.

He agreed that the Nooners was a valuable program because "Well, you do exercises you wouldn't do at home and you never, I never did at the Rehab and you sit, you're in a circle and you're all...and you socialize and laugh and tell jokes and have fun sort of". He would "definitely" recommend the program to others and his reason for this recommendation was that "they might not get perfect, but it sure helps".

He planned to continue "As long as I can and as long as they run it (the class)". He didn't think he could keep up the exercises on his own at home if he had to. He found it much easier to exercise in a group setting rather than at home where he might continually put it off.

Observer's Comments. I observed physical, emotional and social changes in Subject I during the study period. Physically, his walking endurance, balance and coordination were much more efficient. He no longer required his cane all of the time, he did not need to rest between laps, and his left leg did not drag when he walked - he actually flexed his knee and lifted his foot off the ground. I observed that his knee flexion, hip flexion, shoulder abduction and shoulder frontal flexion all improved, as did his grip strength. He still had problems with his left lower leg which got tired and cramped easily, but he was able to do progressively more laps of the track throughout the six months.

When I first interviewed Subject I, he seemed very lonely and depressed. I noted that his social contact seemed to be very limited and the way he got off topic about so many things made me think that he didn't get the chance to talk to people at

length very often. Later, when I spoke to him in class during my observation periods, after only two months of the program he did not give me the impression that he was lonely or depressed. During the mid-program interview in November, he told me that the class was a good group. Then on January 5, he told me he didn't feel depressed anymore. His tone of voice and his attitude were much more positive during the final interview and there were no longer any signs of his being either lonely or depressed. Since this class served as his major change in socialization patterns, it is likely that the class provided an outlet that was sorely needed in his life. I think that he learned to accept his impairment, perhaps because of the socialization with others in the class who were dealing with similar impairments and were of a similar age. He also worked diligently to improve his condition. He was so highly motivated that you could see the determination in his face during the exercises. When the participants didn't come to class he was concerned about them, and when they did come to class, he helped and encouraged everyone. For example, one participant was a young man who had also had a stroke. Subject I gave this man his grip sponge to increase his grip strength. He told the man that his grip also used to be very weak, but now he could squeeze that putty down to nothing. He also encouraged the same man to use the arm ergometer for cardiovascular work, but the man was hesitant because he could not hold onto the handles. Subject I made sure he knew how to use the straps to make it possible to use the ergometer even if it wasn't possible to grip the handles. He noticed when Subject IV, who used a wheelchair, needed a boost and would promptly find a staff member to assist with the boost. He remarked about the huge difference he saw in Subject V when he got a new volunteer: "...he's a good kid (the volunteer). He, he sure helped (Subject V), holy! What a difference. He's gettin' him to keep his head up an', which his wife never did, eh. His head was hangin' a way down like, you know. Now he's keepin' his head up, and he's running the arm machine, which I run, I set it pretty stiff, eh, and I looked at him the other day and he had just, just a little under what

I set it at."

Socially, he was a bit shy at the beginning of the program, only speaking when the leader initiated the topic of conversation. He quickly made friends with the other participants, the volunteers, the staff, and even other members of the centre who weren't in the class. As stated earlier, he came to the centre early to talk to the members of the earlier class.

Program Leader's Comments. The leader also mentioned several observable physical changes in Subject I. In the November interview, she had already noticed an improvement in his walking in that he had better balance, and he had small increases in his overall flexibility. When she was interviewed in January, Subject I had increased the number of laps that he was walking, he was spending more time on the arm ergometer, his strength had improved and so had his flexibility. Her reasoning for these improvements was "...because he takes the effort to work at it - he works very, very hard". By April, she had commented on the increased range of motion of the limbs on his affected side, as well as his improved balance. She also noted his ability to do more laps before and after class.

Emotionally he was very highly motivated both at the beginning and six months into the program. He really wanted to do the things he used to do such as household activities, and he was determined to lose weight. He didn't end up losing any weight during the data collection period, and it was decided that the reason for this was his poor eating habits. In the January interview, the leader thought that one of the reasons he was improving so much was his attitude - she found that he was psychologically very strong and highly motivated. Because of this high level of determination, she even thought he would be able to carry on with the exercises at home if he ever had to. She felt that Subject I just considered his stroke as more of an inconvenience to his life than a disability or impairment. He had accepted this inconvenience and was trying to remain as independent as he could. She offered the example that one day the driver's



side door of his truck had frozen shut. Instead of asking a neighbour for assistance, he climbed through the passenger side. Subject I was a large, awkward man, but very independent minded. The leader even said that she thought his weight problem was more of an issue than his stroke. Her comments on his emotional state were stable through all of the interviews with the following common themes: independent, motivated, concerned about his weight.

“Socially, he’s wonderful. He comes early, classes don’t start till 12:15 pm - he’s usually here around 11:30 am, so he can socialize with the first class...and (um), then he’s usually the last to leave”. Subject I would come to class early to speak with the members of the earlier Nooners class as well as other members of the centre. “Yeah, he’ll come out and just talk, like I think that’s why he enjoys coming early...is that he can come out and talk to people and that’s his main thing in coming out - the socialization part”. The leader would use words such as “really friendly”, “social butterfly”, “outgoing”, and “very interactive” when describing Subject I.

Summary. This program was perfectly suited for Subject I because it was a group setting with participants who were of similar ages and had similar impairments to identify with. The class allowed him a social outing which he really needed because of his limited social contact. Finally, the exercises were done at a gradual intensity so that he slowly improved his strength, endurance and flexibility. He was motivated to work hard and it paid off by improving his life physically, emotionally, and socially.

### Subject Two

Demographics. Subject II was an 80 year old male who was married and living with his wife in a large condominium. They have grown children who no longer live in the city. The level of education that he obtained was a college degree in medicine and a physician's residence. He was a practising physician until July, 1993 when he

suffered a head injury in a freak accident. He had been pushing one of his grandchildren on a swing when he was struck in the head by the swing. The injury affected his balance which, in turn, severely hampered his walking ability. Some areas of cognitive ability were also affected including his perception of time and his speech. His manner of speaking was very difficult to understand both because it was muddled and he did not always make sense.

Subject II stood approximately five feet, seven inches tall and weighed around 150 lbs. He wore thick glasses and one of his eyes was always slightly closed.

Health and Background in Physical Activity. The accident required him to undergo immediate surgery and he ended up being in a coma for several months. He was rehabilitated at a hospital in Florida where his son practised medicine. He returned to Winnipeg in April, 1994.

Subject II was devastated that he could no longer work. He suffered some bouts of depression. He said his family "treated me very well" and they had been very supportive as he tried to rehabilitate.

His daily activities had been totally affected by the injury because even though he was independent in all of his activities of daily living, he required constant supervision because of his balance problem. He hired an assistant to be with him during the day to aid his walking. She was also responsible for driving him and accompanying him to his appointments during the day.

Along with the Nooners class, Subject II was also involved in physiotherapy and speech therapy. His history of physical activity during the four years prior to the accident consisted of power walking three miles each day at the Reh-fit Centre. He believed physical activity was "good" and it had played a very large part in his youth when he biked and played a number of different sports. He realized that a lot of people took part in physical activity and therefore society must feel that it is beneficial for them. This attitude did not change during the six month data collection period, but

he added that he felt physical activity had the ability to enhance people's lives.

He did not perceive any change in his quality of life in the three months prior to the study period other than living with his impairment.

Participation in Program. Subject II was a member of the Reh-fit Centre prior to the accident. When he was ready to do some low-level physical activity, he rejoined and became a member of the Nooners. His reason for joining the Nooners program was "because I have too much time on my hands".

His assistant drove him to the program during the spring and fall, and in the winter, they took Handi-transit. He found it easier to travel in a wheelchair during the winter months. He attended the 11:00 am class with some of the "veteran" members who had been attending this class for up to ten years (as compared to the other four subjects in the study who all attended the 12:15 pm class which had just started). He expected to only attend the class once a week because he had speech therapy at the same time during the Thursday Nooners class. He ended up going to the class once a week on Tuesdays until the middle of March when he finished with the speech therapy, and then he attended the Nooners on both days each week. The only barriers he could think of that would have kept him from attending were severe weather conditions or if he wasn't feeling well. He ended up only missing two classes because he was visiting his daughter out of town, and another two classes because his assistant was off work. Other than these four classes, he had perfect attendance on Thursdays until the middle of March, and both days after that.

Perceived Benefits of Program. In the November mid-program interview, Subject II had already noticed that his body felt stronger and that he felt better after each class. He had also started to find that the exercises were getting easier, but not considerably. Unfortunately, by the January mid-program interview, he hadn't perceived any further changes and actually stated that the exercises were getting harder rather than easier for him. He was frustrated that his walking had not improved

because that was his major goal for the program. Although he noticed the walking getting slightly better, it had not improved as much as he had hoped. In the final interview, he agreed that the program was benefiting him physically. He felt stronger, had more endurance than before, and again, his walking was getting better in terms of balance and co-ordination. He attributed these improvements to a combination of the class and his physiotherapy.

Emotionally, he felt that it was "good for him" to be attending the Nooners. He also stated in the final interview that he was very satisfied that he was a part of the program. He did, however, often feel frustrated during the last part of the class when he took the time to work specifically on his walking.

Socially, he perceived similar benefits at all points in the program. He enjoyed the people in the class, working together with the volunteers, and doing exercises in a circle formation. He said, with reference to the others in the class "I get together with people better, I socialize better".

Subject II concluded the final interview by stating that he felt the Nooners class had improved the quality of his life but he was unable to qualify his answer.

Evaluation of Nooners Program. The aspects of the Nooners program that Subject II liked the most were the social atmosphere and the fact that he was able to be involved in an activity that he had been doing before his accident. He couldn't think of anything that he disliked about the program, and he did not have any suggestions on how the program needed to be changed.

He had no complaints about the atmosphere at the Centre during the class. He felt the volunteers were a beneficial part of the program: "Those volunteers are good. Help those of us who can't do it themselves".

His family had remained very supportive of his participation in the class, but he admitted "...we don't discuss it too much". He did say that he thought it was good for him to be attending the class and that was most important to him - not his family's

opinion.

Subject II would recommend the program to others and he thought that the Nooners was a valuable program for the Reh-fit Centre to run. He planned to continue attending the class as long as the rehabilitation for his walking continued. He was very clear in stating that he could do the exercises on his own if he had to, but he preferred the class because he liked to exercise in a group setting: "...it's harmony, it's like family. it's nice. We like it".

Observer's Comments. Subject II's head injury made him a difficult subject to communicate with and to observe. He was very lucky to have had an exceptionally good assistant who worked with him. She served as a translator, a therapist and a motivator for him. During the interviews, she would clarify his answers or reword my questions so that he could understand them. She explained to me that he had trouble with the concept of time so I had to restructure some of my questions.

Physically, Subject II was quite coordinated when he was seated, but because of his balance, the standing exercises were not performed very efficiently. He was not able to mimic the exercises as the leader performed them - he was passively put into position by his assistant for each exercise, she would help him with a few repetitions, and then he did the rest independently. He would lose concentration and stop doing the exercises, but she would help him get back on track.

Some days that I observed the class, Subject II performed his exercises very well, but on other days, his performance of the same exercise had deteriorated. This made it difficult to discern any consistent improvement over the six month study period. There was one observation day (February 6, 1994) where his walking was better than I had ever seen it. He actually picked up his feet off the ground rather than his usual shuffling gait, and only held on to his assistants' hands from the front with little support. I never saw him walk that well again.

He also improved in his mastery of the exercises. At the beginning of the

program, his assistant would have to physically place his body parts into the starting position of each exercise. After a few months, she had increased her verbal cues and decreased her physical cues and she would just tap him on the body part that was being used during that particular exercise and he would know what to do.

His emotional state was impossible to observe. He was always quiet and pleasant; he never complained or said anything. His face did not convey any change in expression so it was not possible to figure out how much effort was being put into the exercises or stretches, or how he felt in general during the class.

Socially, he rarely interacted with the other members of the class. He was often greeted by others in the class and he would respond, but I never observed him initiate contact with anyone. This could have been for two reasons: 1) he was very hard for others to understand and therefore he may not have been comfortable starting conversations, and 2) he came to the program to work, and not to socialize. However, he did have a short discussion with a classmate at one of the coffee parties. but again, the classmate initiated the discussion and the conversation was fairly one-sided. Also, Subject II's assistant did a lot of the talking.

Program Leader's Comments. In the January interview, the leader confirmed that Subject II came to the class to work at improving himself physically. He was full of determination and the leader noted that he was getting stronger and had increased his endurance compared to when the class had begun in September. In the final interview, the leader said "...walking ability was way better, balance way better, you can see the improvements with him". He had also spent increasingly longer amounts of time on the bicycle ergometer and walking because of his increased muscular endurance and balance, therefore the leader concluded that he may have also gained some cardiovascular benefits from attending the class.

Emotionally, because his communication skills were so limited, the leader also found it hard to determine his emotional state. Even in the final interview, she said it

was hard to see any of the participants' emotional sides since she only saw them for a short time every week and all of them were generally "up" when they attended the class.

Socially, "...he's not a social butterfly, he's just more caught up in coming out to work out". She agreed that he always appeared happy and friendly. The leader had seen him sitting and talking to other members at the Centre but she had to agree when I stated that "It's hard to be sociable too when people will have trouble understanding what you are saying, you know?". She also noticed that he really needed to concentrate when doing the exercises so he was unable to exercise and socialize at the same time as some of the other members of the class did. In the final interview, she said she had seen him "interacting a little more with people", but he was generally quiet throughout the class.

The leader agreed that Subject II had a wonderful volunteer working with him. We tried to figure out whether his vision was impaired and that was the reason why he needed the assistant to physically place him into positions, or whether he was not able to interpret and copy the leader's moves. I asked Subject II in the final interview whether or not he had trouble seeing the leader and both he and his assistant said vision was fine and that he could see the leader with no problem.

Summary. Subject II improved only slightly over the six months. His physical improvements were the most evident difference but he didn't feel that these changes were the least bit significant. He enjoyed the class on a social level and he liked being able to do an activity that he also did before the accident. The group setting was enjoyable for him and he probably benefited from just getting out of his home and being with a group of adults close to his age. In my opinion, the program did increase the quality of his life.

### Subject Three

Demographics. Subject III was an 85 year old female who lived with her husband in their house during spring and summer, and in a Kiwanis Centre apartment for the other six months of the year. The highest level of education that she obtained was an Arts Degree. She had been employed as a school teacher for many years and then worked in the Correspondence Branch of the Department of Education in Manitoba. She was a petite woman who stood five foot three inches, weighed approximately 130 lbs and had quite a pronounced Dowager's hump.

Health and Background in Physical Activity. In 1990, Subject III was standing at a party pouring tea when her hip spontaneously broke. She thought it was just a cramp until the next morning when she couldn't put any weight on her foot. She has been recovering ever since.

The first few months were very physically painful, but she remained optimistic that she would be "back to normal" in no time. When a fast recovery did not occur, she was discouraged and a little depressed because the hip had broken with no warning and she thought it could happen again at any time. Her whole way of life was affected because of her limited mobility. "I couldn't take over the same, so...it just has affected my day-to-day life". Her husband had been very good with her and she became dependent on him for some of the housework and transportation. "Yes, he really looks after me all the time, and he does all he can for me". She felt that she was a bit of a burden to her husband. She was very satisfied with the support she received from their family and friends while she was recovering.

Subject III had seen a physiotherapist right after her hip broke, but at the time of the initial interview, she was not involved in any other types of therapy.

She had not been active in any type of physical activity in the four years prior to the beginning of the study. She was active in swimming, hiking when they went to their cottage, and she had been an avid curler, but these activities had not been



participated in for several years. In the September interview, she thought that physical activity in general was a good thing but she did not know how to elaborate. At the end of the study she couldn't "make up my mind whether it's (the class is) benefiting me or not". She felt that society in general was too busy with their jobs or their families to be interested in physical activity.

Her quality of life fluctuated over the six month data collection period because she and her husband were involved in two moves (from their house to the Kiwanis Centre and back again), and a one month trip to Victoria. She agreed that the two events kind of cancelled each other out, but she did feel that, overall, her quality of life did increase slightly because of her involvement in the Nooners program.

Participation in Program. Subject III and her husband found out about the Nooners program through their children who were members of the Centre. They also knew the Executive Director of the Centre and spoke to him about the best program she could take part in to help rehabilitate her hip.

She was slightly apprehensive about joining the Nooners because it "does take a chunk of our day", and she was concerned that her husband had to drive her to the class, work with her as her volunteer, and then take her home again. She said "It breaks his day up". It seemed as though she was more concerned with how much of her time the class occupied rather than what types of benefits she might experience from the class. As the program progressed, it became evident that she did not like the exercises, but felt that it was something that she had to do. In the mid-program interview in January, she stated "I suppose I should come to do the exercises because they are good for me", and in the final interview she had this to say: "I enjoy seeing the people that are there and getting to know them, but it's not really enjoyable doing the exercises".

In September, Subject III expected to go to the program twice a week because "there's no point in joining up if you don't go". She felt that the only reasons she would

not attend the class would be if her leg was sore. In actual fact, her attendance was very poor. She missed over 20 out of 40 classes between September, 1994 and April, 1995. She told me that she only missed class when she was out of town, and they were gone for the month of March on vacation in British Columbia. However, they also missed six classes because they were either moving out of or back into their house, and several more classes were missed for unknown reasons.

Perceived Benefits of Program. The benefits she expected to see from attending the class were that she hoped to strengthen her hip and get out walking a bit. In the November mid-program interview, she hadn't perceived any differences in her daily activities, but felt she had not been attending long enough to have accomplished any noticeable differences. However, in the January interview, she said her family had noticed an improvement in the way she walked. Even in the final interview, she had not noticed any differences in their day-to-day activities - she did not feel stronger, more flexible or anything else. "I don't really feel that I've got a great deal of benefit" were her words. She felt that there were no differences emotionally or socially that had occurred due to being a participant in the Nooners program.

Evaluation of Nooners Program. The aspects of the class that were enjoyed by Subject III were the people, and just being able to get out of the house. "I think it's a good program." There was nothing that she disliked about the class, and she couldn't think of any changes that she thought needed to be made in the organization and running of the program. When I asked her about the atmosphere of the program, she didn't mention any aspects that bothered her or that stuck out in her mind.

Subject III thought the contributions of the volunteers to the class were "good". Her family supported her participation in the program. As a whole, they thought that any program she participated in to help rehabilitate her hip was beneficial to her. Subject III was hesitant when asked if she thought it was a valuable program that she was taking part in. She would only recommend the program to someone if they were

"very bored or they're, you know, needed help, but for ordinary people to go there. I don't think I'd recommend it.". She did admit that for the members of the class who had had strokes, the exercises with the volunteer's assistance seemed to benefit them.

She did not know how much longer they would be attending the program - it depended on how she "felt". She told me if she felt it was doing her some good, they would continue indefinitely. She admitted that she would not be able to do the exercises on her own.

Observer's Comments. Subject III was difficult to observe because she missed so many classes. Her husband acted as her volunteer for the class and I felt that he was very overprotective of her. He did not encourage her to work with any effort, and he would suggest she stop if she felt anything in her joints or muscles. As a result, any time she felt the slightest amount of muscle fatigue (burn or tightness) she stopped - sometimes after performing only three to four repetitions of an exercise instead of twelve to fifteen like the rest of the class. I don't think she knew what it felt like to exercise - that her muscles and joints would feel different from the way they feel during everyday activities. She needed to work with more effort to be able to notice any physical benefits resulting from participation in the class. They also needed to attend regularly. These are the reasons that I did not observe any physical changes in Subject III.

She socialized with the others in the class periodically, but mostly stuck very close to her husband who did a lot of the talking for her. She said that the class was fun and that she enjoyed the people. There were no noticeable emotional changes either - she just showed up with a smile and did what exercises she could. One of the volunteers commented that Subject III was overprotected by her husband and it seemed as though they only needed a minimal excuse not to attend the class.

Program Leader's Comments. In the first interview with the leader, she noticed a slight physical improvement in Subject III. She also felt that Subject III's husband

was the factor limiting her improvement in that he was more worried about her doing the exercises than Subject III herself. The leader felt that she could have done a lot more that she did in class.

The leader felt that Subject III would be better off without her husband as her volunteer. He even did the talking for her. If her attendance was more regular, the leader expected that they would have seen an improvement in her strength and mobility. The leader also did not notice any emotional differences and noted that Subject III was dependent on her husband for social interaction with others in the class.

Summary. In summary, if Subject III had a volunteer other than her husband, and that volunteer made her work with a little more effort, and if she attended regularly and knew what to expect from the program, she would have seen many more improvements physically, and even emotionally including a higher degree of independence, self-esteem and pride in improving her quality of life.

#### Subject Four

Demographics. Subject IV was a 48 year old male who was married and had two children. One child was going to school in New York, and the other lived independently in Winnipeg. Subject IV and his wife lived together in a house. He had a PhD and was employed full-time as a professor in Winnipeg.

Health and Background in Physical Activity. When asked about his health conditions, he replied "You have a long tape there, do you?". He had Multiple Sclerosis (MS) as well as coronary artery disease and diabetes. He was essentially a paraplegic and was totally dependent on the use of a wheelchair for mobility. The MS was diagnosed in the spring of 1981, the coronary problems were present prior to the diagnosis of MS, and the diabetes was only recently diagnosed. The diabetes was controlled by a combination of diet and medication.

As well as these three major impairments, Subject IV was very overweight and suffered from a slight hearing loss in both ears. He was completely dependent on the Home Care system to get him up in the morning, and get him into bed again at night because of his size and limited mobility.

When he was first diagnosed with MS he felt "very distressed". He was "dealing with a physical crisis and I didn't know how to handle it...and, uh, it was a long period of dealing with it and worrying about it and learning to live with it and calming down...". His daily activities were completely affected by the impairments. He had no use of his legs. Handi-transit was his main form of transportation. He was able to use a manual wheelchair on the Sabbath, but otherwise used a specially made electric wheelchair. Because several of his body systems were compromised, anything from a flat tire on his wheelchair to a major infection could "stop me in my tracks". He had frequent hospital stays for various reasons (twice during the data collection period) which drained his energy for a time afterwards, and especially affected his muscles. He was often bed-ridden and therefore suffered from muscle atrophy.

Subject IV experienced mixed social support from different people when he was diagnosed with MS. The majority of his colleagues were very supportive and co-operative. He felt very lucky in this regard. He had lost some acquaintances: "A lot of people disappeared on me, a lot of other people have become very uncomfortable...". He travelled less frequently to conferences and meetings as the MS progressed and therefore his professional circles changed. He was still able to keep in touch with colleagues over the computer.

The only family he had in the city were his wife and son. His son was "of no support at all, really". He and his wife were "braving it through" together, and she was his major support.

He was not involved in any other types of rehabilitation programs during the study, nor had he been involved in any physical activity or sport for more than four

years prior to the study.

Participation in Program. Subject IV needed to join an exercise program that would allow him to maintain his upper body strength and perhaps build some extra muscle so that he would not lose as much strength and endurance when he had long hospital stays. He had looked into joining the Centre two years ago, but the staff was hesitant about his being in a wheelchair. They did not have a program or staff in place to accommodate an individual with so many health problems. Then, after his coronary arteries collapsed, he was again directed back to the Centre and turned down a second time for the same reasons. When the second class of Nooners was set in place, Subject IV received a phone call to join the program.

Unlike the other members of the class, Subject IV arrived at the Centre around 11:45 am and had to leave to get back to work at 12:30 pm. When he arrived at the Centre, he warmed up on the arm ergometer for about five minutes, then he did upright rows, latissimus dorsi (lat) pulldowns, tricep pressdowns and bicep curls on the Universal equipment. He went back to the arm ergometer where he did 10 -12 minutes of pedalling, and then if time permitted, one more set of weights. He then joined the class for the warm-up and upper body stretches. He left the class when they moved on to the leg exercises so he could return to work.

The biggest barrier to attending the class that he perceived were the logistics of being able to get to the program on time, do his exercises, and make it back to the university in time for his next class. He expected to attend Nooners both Tuesdays and Thursdays every week and even planned on adding a third day a week to use the weights. This third day never materialized. He missed four classes in the data collection period: one because of a religious holiday, two because of illness, and one because of work-related business.

Perceived Benefits of Program. Subject IV was hopeful about joining the program. His goals were to improve or maintain his upper body strength and

endurance. Also, besides the Nooners class itself, the Centre had some weight equipment that could be used by individuals in wheelchairs. He found this encouraging because he hadn't thought there would be much else he would be able to participate in at the Centre other than the class.

As stated earlier, Subject IV's perceived benefits were to improve or maintain his upper body strength and endurance. The actual benefits he experienced were difficult to assess. In the final interview he was asked what physical benefits he perceived as getting from the program, and it was difficult for him to answer because he had just spent time in the hospital which really set him back physically. "I usually measure it (his physical condition) against the most recent input, most recent input is after being in bed for some days in hospital, I'm at a deficit position. So, it's not a good time to ask". His wife, however, had noticed that he was somewhat more flexible when using his manual wheelchair. She thought he was pedalling with greater ease. He complained of soreness in his arms and shoulders during the November mid-program interview, but he was no longer bothered by soreness two weeks later.

Emotionally, he felt good about being involved in the program. He was proud of his ability to increase the weights he was doing on the Universal equipment, but "I'm not terribly impressed because I haven't increased a lot". Even after only two months of being in the program, he felt a sense of accomplishment for actually complying with his program. He said it was motivating to be a part of the class.

He hadn't experienced any appreciable changes in his social life, but did state that he found the class socially "pleasant". He thought the coffee parties were a nice change of pace to the usual class structure.

In the September interview, Subject IV's attitude about physical activity was that there were not enough hours in the day for him to take part. He was too involved in his regimented life of being up by six in the morning and in bed by twelve every night with work in between to have time for exercise. He didn't feel that society in general held

physical activity in very high regard - they mostly just paid it lip service. In the final interview, when he was asked if the Nooners program had changed the way he felt about physical activity, there was a long pause and a tentative "yes". His explanation was that the program was a positive, socially pleasing environment, and this allowed him to enjoy physical activity. His attitude changed once he knew what to expect out of the program, and he compared it to the exercise program he was involved in at the Rehabilitation Hospital where the exercises were done one-on-one. He found the group setting much more enjoyable.

Nothing significant had affected his quality of life neither three months prior to , nor during the study. When he was asked in the final interview, Subject IV felt that the six months of the Nooners program had changed the quality of his life because it had served its purpose in helping him maintain his upper body strength and endurance. He also stated that the class "provided a good output" and was a nice break from daily hassles. "I'd say it's good, and it's changed my life, but not appreciably. I mean it has not become an overwhelming piece of my life."

Evaluation of Nooners Program. "It was good fellowship which provided me with a good environment and I needed the discipline of knowing I'm coming at these times and I'm doing my thing. And, you know, it wasn't heavy supervision". Along with these comments, Subject IV liked to be able to work on his own doing the universal weight machine exercises and the arm ergometer but still being able to call over a staff member if he required assistance. The only thing that he hadn't liked was the rushed nature of his visits. He tried to shuffle his work schedule to better accommodate the class, but nothing could be done. He would have liked an elevator or a lift in the Centre so he could have gone up to the second floor for an occasional cup of coffee, and he would have liked to see the class held three times a week for more flexibility, but admitted that this would wreck havoc with his schedule.

There was nothing distracting or unpleasant about the atmosphere of the



Centre during the program according to Subject IV. He was actually fascinated by the line dancing class that was run concurrently with the Nooners on Tuesdays. Because of his hearing problem, the music didn't bother him nor did the number of other members of the Centre that were moving about around him during the class.

Subject IV did not have a volunteer. He didn't think that any of the volunteers were out of place or in the way during the class. "You know, if the group works well as a group, then any person who has a piece of it is valuable". He said that the volunteers seemed to make the whole class work together well.

His wife was his main source of support and she continued to support his participation in the Nooners program. There was no other special support that he received from anyone else throughout the six month data collection period.

He thought there was an expressed need for an exercise program such as the Nooners for individuals with multiple disabilities because they just don't exist in other places in the city, especially if the person has cardiac complications as well. He would love to see the program run three times a week, and he planned on continuing with the class for as long as he could. He wasn't sure if the exercises were something he could keep up on his own if there wasn't a class for him to attend. He would recommend the class for anyone who has a disability and who doesn't have the motivation or skills to do exercises on their own.

Observer's Comments. Subject IV was a very emotionally stable man. He had lived with setbacks that occurred because of his disabilities for so long that he had accepted them and moved on. He could only maintain what upper body strength he had at the beginning of the program because of his level of physical activity and the number of hospital visits he experienced. He realized this, and was very realistic about what his body could accomplish with exercise. He worked very hard at the weights and stretching exercises. His shoulder range of motion was fairly poor because it was impeded by his wheelchair and the amount of fat on his arms and

upper body. For instance, his left arm only abducted to 90 degrees. During the program, his arm endurance and strength increased which was evident in the longer amount of time he spent pedalling the arm ergometer and his increase in weight on the Universal equipment.

He had a great sense of humour and amused the class with his “joke of the day”. He was always in a good mood during the class and was a main conversationalist throughout the class time. He mostly socialized with Subject I because they were both outgoing and they sat next to each other.

Program Leader's Comments. In November, the leader noticed that Subject IV had increased his upper body endurance, again by the fact that he remained on the arm ergometer for longer amounts of time. He had a decrease in muscle soreness, but his flexibility hadn't seemed to change. The leader called him a “social butterfly”, and noted that he had a great sense of humour, was outgoing and was very open about his disabilities likely because he had lived with them for so long.

Psychologically, he was a very highly motivated individual which was evident in the extra day he came to the Reh-fit Centre on his own because he knew he had to miss one class. She suspected that Subject IV would not be able to do the exercises on his own mainly because he required assistance setting up the equipment. In April, the leader thought that Subject IV was at a standstill in his improvements because he was in some degree of pain. She had noticed an increase in strength from September and had to increase his weights an average of 20 lbs for each exercise. She said that he would do fifteen minutes of pedalling on the arm ergometer. The observations and his comments indicated that he started and stopped several times while on the ergometer, and counted the number of rotations he had done rather than the amount of time.

“Socially he's wonderful”. She mentioned that she enjoyed his “joke of the day”, and she referred to him as “very warm and friendly”. She saw him as a very

positive person even if he was in a lot of pain. "He's a pretty positive person. so I think that that's what enables him to sort of get through things".

Summary. Although he didn't conform exactly to the class schedule, the program was beneficial in allowing him to increase his upper body strength and endurance partly on his own time, and partly within the class setting. He enjoyed the other participants and the class allowed an outlet from his hectic daily schedule. It gave him some time to do something to improve himself physically and emotionally.

### Subject Five

Demographics. Subject V was a 56 year old male who was married and lived with his wife on a acreage on the outskirts of Winnipeg. They had no children. The highest level of education that he obtained was a Masters degree, and he was employed as a professor. At the time of this study, he was on disability leave from the university. He was approximately five feet, ten inches tall, 160 lbs. He walked with a slow, bent over gait and therefore used a cane to help with his mobility.

Health and Background in Physical Activity. On June 11, 1993, Subject V suffered a stroke which partially paralyzed the left side of his body and severely affected the strength in his left leg, foot, arm and hand. He walked using a cane, and he had difficulty holding his head up and his upper body erect.

When he was made aware that he had suffered a stroke, his first emotion was disappointment. This feeling lead to depression in the following days. The stroke left him unable to do any carpentry, or to hunt and fish; activities that he had been very active in prior to the stroke. As well, he was no longer healthy enough to continue in his profession and had been forced to take a disability leave of absence. This greatly added to his disappointment and frustration, and gradually lead to depression.

He felt that most people treated him with kindness after his stroke, and he found most of this support to be satisfactory. When we were discussing the level of support

he received from his co-workers, I sensed that he was not satisfied at all, although he stated that he was. For example, he seemed quite bitter when the university moved him to a temporary office in another building because it was easier to access by elevator. He gave me the impression that he did not care for the special treatment.

Subject V was also involved in an exercise class run at the Pan Am Pool which was partially sponsored by the Heart and Stroke Foundation. It consisted of the same types of chair exercises as the Nooners program, but the participants were invited to swim afterwards. According to Subject V, there was a lot more one-on-one interaction during and after the class between the participant and their volunteers in The Pan Am Pool program which he really enjoyed. He got along especially well with his Pan Am volunteer who ended up volunteering with Subject V in the Nooners program as well. He was also involved in psychotherapy and was on a drug program under his doctor's supervision to aid in his rehabilitation. As well, he performed some the chair exercises at home by himself.

His past involvement with physical activity was mainly in the form of hunting and fishing. He also enjoyed snorkelling when he travelled. He did a great deal of construction, maintenance and landscaping on his estates at Iles de Chenes and at Black Sturgeon Lake in Ontario which kept him in shape.

His attitude about physical activity was that it had to be an activity that was motivating and acted as a means to an end for him to enjoy engaging in it. Gardening, for example, had an end result of a lovely garden to show for your efforts. He felt that physical activity was beneficial and he felt that society must agree with this because they spend a lot of time and money promoting the "Active Living" concept. His attitude remained the same throughout the data collection period.

He felt that besides the stroke, having to forfeit his driver's licence hampered his quality of life the most. The Nooners did not change his quality of life, nor how he felt about physical activity.

Participation in Program. He and his wife looked into joining the Nooners program because the work he had been doing with five physiotherapists had not made any significant progress, and he was looking for a program that would continue his progression towards wellness.

He expected to be at the program twice a week, and figured that he would only miss if he had difficulty arranging transportation. His wife drove him at the beginning of the program, but later he took Handi-transit from the University. He also considered that he may leave the class if he felt it wasn't giving him the benefits that he anticipated. He ended up missing three classes because he was out of town.

Perceived Benefits of Program. His goals were to be able to run again or at least to be able to move quickly without using his cane, and to build up some muscles in his left arm and leg. His only feeling about starting the Nooners class was that he hoped it would help him to recover quickly. In the final interview, Subject V made it clear that he had expected to improve his walking far more than he actually had. The benefits that he did perceive were that he had strengthened the muscles in his limbs on the left side, and that his walking endurance and gait had slightly improved. He did not attribute the improvements to the program but to his "general recovery" due to the passage of time: "I have, I have done many things to try to recover and rehabilitate from my stroke. I think I've done well, and I've made some significant progress. To attribute it to this program would be a bit, ah, premature, or it would be incorrect to do that." Whenever I asked him whether or not he thought he was improving in any area, he very quickly responded "No", "Not enough", or "Not fast enough". He had very high expectations for the program and for himself. Once it was broken down for him, he would actually realize that he was making some progress. For example, his wife told me that he could walk several blocks now compared to one year before when he was totally dependent on his wheelchair to get around. When Subject V heard this, he admitted that his body was making progress.

He felt that he had improved his emotional state over the previous six months through his work with a psychiatrist who specialized in working with individuals who had suffered severe trauma. He felt that his psychotherapy had been "the most effective treatment" for himself.

He also stated that his social life had improved because he had been able to get out more now that he was walking compared to when he used the wheelchair. His wife pointed out that he had increased stamina so they could stay up later or stay out of the house for longer periods of time before he tired.

Evaluation of Nooners Program. When he was asked if he enjoyed the Nooners program, he replied "Not particularly". He compared the class to the similar class at the Pan Am Pool which he enjoyed a lot more because he liked to swim instead of walk around the track at the Centre. He did say "I guess I enjoyed meeting some of the people that were in the program".

There were two aspects of the atmosphere in the fieldhouse that were not to Subject V's liking. First, being a musician, he was not impressed with the music that played in the fieldhouse during the class. "Let's talk about what you call music in that place. Music to me is a sacred word because I used to be a musician, and what came belching out of those loud speakers was, could be best described as something close to noise". He also commented that he found the fieldhouse temperature to be too cold.

Subject V said the volunteers he saw participating in the class were very good. He started out with his wife as his volunteer, and although he didn't say this directly to me, he felt like she was spending too much time with him during the program because she was a very busy woman. He finally found another volunteer that he greatly enjoyed working with. He was the same volunteer as in the Pan Am Pool program as stated earlier.

His wife continued to support his participation in the class but gave up being his volunteer after January, 1995. "My wife has certainly been the most supportive of the

program”.

Subject V would recommend this program to others but with caution. He told me that anyone joining the class should be made clear on how much they could expect to recover by participating. He felt that he was misguided when he joined and was led to believe he would be walking perfectly in no time and could be totally rehabilitated. He would have appreciated “a clearer definition of the purpose of the program and what benefits a typical participant may expect from the program”.

He thought he would keep up his attendance at the program “until I get tired of it”. He thought that he could keep up the exercises on his own without having to attend the class at the Centre.

Observer's Comments. Subject V was not comfortable talking about his impairment or his feelings about the impairment, and as a result, his answers were often vague and brief. He felt that by my asking him about his stroke, I was constantly reminding him of his severely affected physical capabilities. He was not comfortable being in any group with others who had similar disabilities, because it reminded him that he had a chronic physical impairment. “That’s difficult to be with these people all of the time. Realizing that you’re, like them. It’s a constant reminder that you’re, you’re like them. Some of them are severely limited in what they’re able to do”. Other subjects liked the group setting because it made them feel like they weren’t the only person with a impairment. Subject V had “serious doubts about group programs”.

His physical abilities definitely improved over the six month observation period. His walking improved due to better balance, hip flexor strength and ankle range of motion. His endurance improved from September walking only one lap of the track and resting half way, to doing two laps without a rest six months later. I believe he could have done more laps but chose not to because he found them boring. He also worked on the arm ergometer after class and increased his pedalling time as well as the amount of tension on the wheel. He used to really drag his left leg when he

walked, but in April his left toe almost faced straight ahead, and he picked up his foot off the ground as he walked. His left arm and leg were strengthened and his range of motion in those limbs improved substantially. His left arm had greater co-ordination, and the tone in his left hand had improved to where he could grip a wrist weight. In the upper body, he progressed to using one pound wrist weights by the fifth month. His wife stated on January 19, that he had improved "one hundred percent" from the previous year when he used a wheelchair and had no use of the appendages on his left side. Even since September, she and Subject V's mother had noticed his increased endurance for walking and being able to stay out later as well as his increase in energy level.

He became increasingly more involved in group discussions beginning with a side comment here and there in the early parts of the program, to actually starting a discussion. Some days he seemed agitated but other days he was very cordial and outgoing. He would say "Hi" to everybody in the class and even to one lady in the earlier class. One day he even made a point of greeting me with a tap on the shoulder. He commented in the final interview that he liked his Noonan classmates.

His biggest overall improvements came about when he began working with a new volunteer in the last week of January, 1995. The volunteer was a young man who also volunteered with Subject V at the Pan Am Pool program. He was a welcome change from having his wife as his volunteer. She was wonderful to him, but he resented her helping him in the class and nagging him to work harder. He saw her as being too busy to have to take the time being his volunteer. Subject V appeared happier, worked with more determination and improved physically upon the arrival of the new volunteer. He even walked holding his head up and his back straight compared to the hunched over, sagging-head posture he started out with in September. He may have enjoyed working with this young man because he didn't have any children of his own, and this volunteer also had a disability so they could



sympathize with each other's struggles. Emotionally, the new volunteer motivated him to concentrate and work very hard during the class.

Subject V gave me the impression that he did not think that physical activity was beneficial to a person's health. He made a comment at one point that I was "beating this activity idea down our throats." He thought that I was trying to find out how active he had been prior to his stroke, and if he had been more active, he could have prevented the stroke from occurring. I told him that this was not what I was trying to accomplish, rather I was interested in how physical activity could help improve his quality of life and his ability to rehabilitate after the stroke. He told me that he hoped I wasn't going to perpetuate the myth that if everyone was highly active, no one would suffer from problems such as a stroke. He figured the major reason he was gaining back strength and co-ordination was that he was just "getting better" like someone would get better from the flu.

Program Leader's Comments. Before I began the data collection, I was speaking to the leader of the Nooners program about possible participants for the study. She said that there was one person in particular (Subject V ) for whom it would be very interesting to see how much progress he could make in the Nooners program. He had been very depressed and withdrawn since his stroke. She was positive that the program would greatly benefit him in all aspects - physically, emotionally and socially.

In the November interview, the leader had already noticed an improvement in Subject V's walking in that his endurance had improved. She commented on his hunched-over posture and goofy grin as being a sign that he was "not proud of who he is". He really wanted to be independent but he still required help for several activities.

In April, the leader emphatically expressed the following: "(Subject V) has improved! Phenomenally. He's able to walk with just assistance, without his cane. So balance has improved, strength has improved, flexibility improved. He's working really

hard". She attributed the differences to an increase in his confidence level, and the positive atmosphere and good interaction with the other participants. He even told jokes in class whereas at the beginning of September, he barely spoke at all. "I think he's got a lot of mood swings. I think that he tries to... he really controls himself when he's here because he's that type of individual. He wouldn't allow himself to have mood swings here".

The leader thought that the peer group was very good for him on a social level because there were two other men around the same age who were also professionals, so that he would realize he was not the only one a stroke could affect. She also felt that he was lucky to have such a caring wife who took the time to be his volunteer. She was equally delighted when his new volunteer took over in January. The leader could not believe the physical and emotional changes that she saw in him.

Summary. I believe that Subject V had the most amount of room for improvement in his health physically, emotionally and socially. Observations by myself and the leader of the program as well as passing comments by other participant and members of the Centre made it obvious that some physical and social progress had been made. Although he did not attribute the improvements to his participation in the Nooners program but rather to the passage of time, his time with the Nooners class was beneficial to improving his quality of life.

#### Themes Emerging from Interviews/Observations

The data from the pre-intervention interviews, the mid-program interviews, and the post-intervention interviews, as well as the observer's data and the program leader's comments were combined in order to condense the findings into themes. Seven major themes emerged and were organized into categories: the characteristics of the subjects, the benefits of the program and participation in the program. The seven themes were: dependence, depression, support, expectations, physical

improvements, social interaction, and effort. A discussion of each theme and quotes to substantiate these themes follow.

### Characteristics of the Subjects

Dependence. The first major theme that emerged was that all subjects experienced dependence on others to a varying extent after their impairment occurred. From the addition of a weekly Home Care visit for one subject after his impairment occurred, to employing a Registered Nurse to help with daily activities for another, each subject ended up being dependent on someone.

"I can't cook at all and I, I have a Home Care come do my laundry and my, uh, vacuuming."

Another subject stated:

"(My disability) has affected it (day to day life) in immeasurable ways. I am incapable of getting started or getting stopped myself. I have Home Care to get in and out of bed, but I do pretty good in terms of being independent in between."

Dependence on others was the most prevalent theme that emerged from the data. It was also the factor in the subjects' lives that caused them the most amount of frustration. Many times, subjects would state that they were still partly capable of doing certain things, but assistance made the chore much easier. Subject III stated:

"He (my husband) does all he can for me. The shopping, and helps me with the meals if they're hard to do. You know, we do things together"

Subject I told of a similar problem:

"I've only got a little supply of clothes, eh. ...I can't carry the things downstairs, I can, I can get them downstairs - fire 'em downstairs but then when, when I wash em, how am I gonna get 'em back up again?"

Subject I depends on Home Care's once a week visit to help with the laundry and cleaning of his home. Subject II had to hire a nurse to aid in his daily activities. The nurse explains:

"He's independent with everything, but he needs a standby because of the balance problem. I know it's been frustrating for him too because he is very independent. He's a perfectionist and having to rely, even though he is independent in his activities of daily living, having to have somebody around."

Subjects 4 and 5 both relied on others for transportation:

Subject IV came to the program between classes where he taught and was on a very tight time schedule. He explained the logistics of getting to the program and having to depend on Handi-transit:

"(I) was sort of anxious whether I could get transport arranged on that tight a schedule which Handi-transit has arranged, I mean let's hope that no buses break down or something like that."

Subject V mentioned later in the interview that one of the events that decreased his quality of life as a result of having the stroke was the loss of his drivers licence. He found that his activities were suddenly limited. He now had to rely on his wife for transportation:

A: "How do you get to the program?"

S5: My wife drives me.

A: Right, and she's your volunteer too, is that right?

S5: Well, she's a reluctant volunteer.

A: Oh, is that right?

S5: She has a lot of work to do at home..."

It was evident in talking to all of the subjects that daily activities would never be done in the same manner again after the impairment occurred, and in most cases, the subjects needed help in one form or another. Since most of the subjects were healthy and vital before the impairment, their dependence on another person had put a damper on their quality of life. Their level of dependence also affected their ability to participate in the Nooners program. All but one subject relied on someone else for transportation to and from the Centre. If a spouse was unable to drive them, or Handi-transit was unable to pick them up, they would not be able to participate.

One reason why exercise was so important to these subjects was so they could gain back some of their independence. By increasing their physical abilities such as strength and stamina, they could do more things on their own without being dependent on anyone. This Nooners program focused on maintaining strength, endurance and flexibility in order to allow subjects to perform activities of daily living with less assistance, or without any assistance.

Depression. With an event as devastating to daily life as a chronic physical impairment, it is highly likely that most people will go through some amount of depression. Four out of the five subjects in this study admitted to living through some depression. Subject II had been practising medicine until his accident, and he found it very frustrating that he could no longer work:

"I had the idea that I want to work, and I can't work. This is the idea... not being able to work and saying I want to and being depressed about not doing it (working)."

Subject III also said that her impairment slowed her down, and she was worried that because her hip broke with no warning, that it might happen again:

S3: "...I thought it would get better. I was optimistic, but it's taken much longer than I'd thought it would.

A: Mmhm.

S3: Little discouraged about that.

A: So, emotionally you, you were discouraged?

S3: Yes. And a little depressed because I had thought that well, it, you know it just came so fast, it would go again, you know?"

Initially, Subject IV was devastated when he was diagnosed with MS:

A: "How did you feel when you first were diagnosed with having MS?"

S4: (laughs) In great distress, but that's ancient history.

A: But at the time?

S4: Miserable. I was dealing with a physical crisis and I didn't know how to handle it, and I didn't know what MS was all about, and the medical establishment wasn't very much help, and uh, it was a long period of dealing with it and worrying about it and learning to live with it and calming down and

so forth.”

Subject V also dealt with depression after his stroke. He was only 56 years of age, still working and very active in the construction and maintenance of two homes in rural Manitoba and Ontario. When he was asked what types of emotions he went through after discovering that he had had a stroke, he replied:

“I was very disappointed. And later on I became depressed.”

He remained depressed throughout the data collection period. He had difficulty coping with and accepting his disability:

“It’s very difficult yeah, socializing with people who are having severe problems with which you are also having. That’s difficult to be with these people all of the time. Realizing that you’re, that you’re like them. It’s a constant reminder that you’re, you’re like them. Some of them are severely limited in what they’re able to do.”

Subject V found some relief from his depression through a psychotherapy program that he was involved with:

“I see a psychiatrist once a week for an hour or two on Wednesdays and that has helped me considerably. The psychotherapy program has helped me a great deal. So of anything, that’s probably been the most effective treatment for me.”

With the exception of Subject V, none of the subjects showed outward signs that they suffered from depression during their time in the class. Subject V was moody, angry and frustrated in many classes that were observed, especially if his wife was volunteering with him. However, it is a very normal reaction to be depressed after a physical impairment occurs because life may never be the same, and that is hard to accept. Depression has a great effect on an individual’s quality of life. Other than Subject V, most of the subjects had some depression when their initial impairment event first occurred. They possibly learned to cope better with their impairments, and the depression may have lifted. I was unable to observe whether or not the class actually helped to alleviate depressive symptoms.

Exercise is expected to help alleviate depression in some populations, although the studies have not wholeheartedly supported this notion (O'Connor, Aechenbacher & Dishman, 1993). The Nooners class provided endurance exercise, resistance exercises and flexibility which all have the potential to improve depressive feelings in an individual.

Support. The next theme relates to the amount of support the individual perceived they had after the physical impairment occurred in their lives. Most subjects described positive support, but others felt they did not have the type of support they would have liked in certain situations or by certain individuals. Subject I was happy with the support he received from different friends and family members:

S1: "I've had lots of help, yeah.

A: Good, good. Has this support been satisfactory to you?

S1: Yeah, I guess. Yeah."

"Oh, my sister-in-law says it's the best thing (being in the Nooners class). The best thing for me. It, it's good there, she says. Some relatives of hers went there and she says it was really good."

Subject II also found that family members were extremely supportive:

A: How have people treated you since...

S2: Treated me very well.

A: Good. Well, obviously your son was looking after you for awhile, since...

S2: My wife, my daughters...

A: Good, and the, and the support has been, has been satisfactory to you?

S2: Yes."

After her hip broke, Subject III found that her family, friends, and especially her husband provided a great amount of support to her:

S3: "Well, my friends have all been very kind and understanding, good to me.

A: Good. And Mr. (Subject III's husband)?

S3: Well, you can, you can imagine what he's like, I think, if you've seen him for a little while. Yes, he really looks after me all the time, and he does all he can for me."

After the intervention, her family still continued their support:

"They think it's good I do, anything I do is good."

Subject IV had a different amount of support from his colleagues:

"The people I work with here at the university have been exceptionally humane, and cooperative, and I've been very lucky in that regard. Other people have been absolutely miserable. A lot of people have disappeared on me, a lot of other people have become very uncomfortable. Social circles and so on have changed, and my own professional circles have changed and I'll travel hardly at all anymore which means I don't get out to professional meetings and so on, so my orientation there is different. I'm much more into computers and dealing with people on computer lines than dealing with them in person. So there has been a lot of changes." He had this to say about his family support:

"Well, I have no family in the city other than my wife and my children and we've gone through a number of crises. It's been very difficult these last years. Right now I have, uh, well I have two kids; one son who's living independently now, and who is of no support at all, really, he's on his own. The last year he's needed more my support than me getting his. And my daughter who is in the last year of high school is in school in New York, so she's out of the home most of the year. And so it's just my wife and I who are braving it through."

After the six month intervention, I asked Subject IV if his friends and family continued to support his attendance at the Nooners, and he said: "Yes, yes, yes."

Subject V expressed some comments after our initial interview about his teaching situation at the university. He did not feel he was contributing to the work he was previously doing before his stroke. The university moved his office to a more accessible building to accommodate him, but he felt they were hiding or getting rid of him. The following are his comments about the social support he had received:

A: "How have people treated you since you had, since you had your stroke?"

S5: With kindness, I guess.

A: So has this support been satisfactory to you, then?

S5: In most cases, yes."

"My wife has certainly been the most supportive of the program."

Support for all of the subjects varied. Most subjects found that family and friends were very supportive after their impairments occurred. The program leader and I observed on several occasions that the subjects were supportive of each other



during class. When asked if Subject II could maintain the exercise program on his own, he replied:

“I could do them on my own. Uh, but the people want to work in circles, and it’s harmony and it’s like family, it’s nice. We like it.”

His nurse mentioned that he has received a lot of compliments from classmates and other members of the Reh-fit that are not in the program about how he has physically improved.

I believe that family support for some subjects was very influential in their coming out to the class (Subject III & V). However, others stated that it was their decision whether or not to participate (Subject I, II, & IV). It did not matter if the family wanted them to attend the Nooners or not, they thought it would be for their own benefit.

Because Subject I lived on his own and had little contact with family and friends, he found support from within the Nooners program. He very much enjoyed being a part of the program and only once did he miss a class. He was always willing to help out. He would come early to class to assist in setting up the chairs and making sure everyone had their own equipment.

Logbook entry on Feb. 16: (Subject I) very concerned about others in class - (a classmate) getting a chair with no arms, (Subject IV) getting a boost”  
He was also very encouraging to his classmates:

“I gave him (a classmate) my one sponge. I got two sponges that I bought when I was at the Rehab. so I gave him the soft one, and we put it in his hand and he could hold it for a while, but he can’t squeeze it. And I said “well that’s how I started and I , I now, I got the strong one and I can squeeze it right down to nothin’.”

Subject I also commented on the progress Subject V was making since getting a new volunteer:

“He, he sure helped (Subject V), holy! What a difference. He’s gettin’ him to

keep his head an', which his wife never did. Now he's keepin' his head up and he's running the arm machine, which I run...I keep telling (another classmate) to try it. ...encourage him a little bit, you know."

I made a note during one of my observations that Subject IV congratulated Subject I on the amount of effort he was putting into his exercises. All of the subjects were very supportive of one another throughout the six month observation period.

Again, with the exception of Subject V, all of the subjects enjoyed the encouragement they received from one another. The leader, volunteers and other members of the Reh-fit Centre were supportive as well, commenting on the progress made by the subjects.

Expectations. This theme includes the perceived benefits the subjects expected to gain from the exercise program. Most subjects had high expectations of what types of benefits would come from participating in the Nooners program. For example, Subject V, who had very impaired mobility had this goal:

"I'm hoping I'll be able to at least run again or, uh, move quickly, or walk rapidly without a cane."

Other subjects had more realistic goals for their recovery:

A: "So what do you hope to get out of the program?"

S3: "Well, I hope to be able to get my leg a little stronger."

And Subject IV:

"Well my personal goals, like I said before, are to increase, if possible, to maintain is I think a reasonable goal, my upper body strength and endurance."

Subject I's goals were as follows:

"Well, I wanna lose some weight for one thing, an' uh, strengthen my arm, and uh, that's the main things. Get some coordination back..."

Subject II had one simple goal: "Just keep going." These were the expectations before the program had begun. In the post-intervention interview, I asked

whether or not their goals had been met. On the whole, the subjects expected to have received more benefits than they actually did. Subject I wanted to begin walking independently. "I walk better" was his reply, but he still had to take someone's arm in order to balance. Subject I felt the same way:

"(I wanted to) walk and run and have some strength."

Subject IV had a difficult time answering this question because of certain circumstances:

"I usually measure it (physical impairments) against the most recent input, most recent input is after being in bed for some days in hospital, I'm at a deficit position. I'm always at a deficit position after being laid up. So, it's not a good time to ask."

"I didn't have any specific expectations other than keeping myself occupied and challenged: sort of maintaining, and I did, and I have, so yeah, I have no big disappointments."

Subject V pointed out to me that he did not know what to expect from the program before he began:

"I would like, yeah, perhaps at the beginning they could be more specific in what they are trying to achieve... . It's not very clear what the program is when you finally get there."

He did not reach the goals he had set before the program:

"For example, I, I, I was hoping that I would have improved my walking far more than I have. Well, it, uh, helped me strengthen some of the muscles that I think, that needed strengthening."

I asked the program leader in April if the subjects were told what improvements they could expect to see when joining the program:

A: "At the beginning of the program, were the participants told what benefits to expect? What types of things they could from the program?"

PL: No, what we're trying to do is at least maintain their abilities...that's. it's basically a maintenance program, but hopefully they'll see some improvement which they all have. We don't want to guarantee them any improvements; we don't want to set them out to reach the moon and not get there, you know.

A: Oh, of course. But were they told this is a maintenance program?

PL: Yep. It was a clear guideline to what we're doing."

In general, the exercise intervention did meet some of their expectations.

Physical improvement was their main goal for the program, and they all showed some improvement, but none of them returned to their pre-impairment state which, I believe, some of them expected. This leads to the next theme of physical improvements which was closely linked to the individual's expectations of what they would accomplish from the Nooners program.

### Benefits of the Program

Physical Improvements. As previously stated, the benefits most expected by the subjects in the Nooners program were physical improvements. In their minds, exercise may have the capacity to make physical improvements but may not impact emotional or social aspects of their lives. This may have been the main reason that the subjects did not see many emotional or social improvements. Each subject did see some physical improvements. The program leader noticed improvements in

Subject I:

"He's (Subject I) able to walk a lot more now. He's able to go through greater range, especially on his affected side. Um, his balance is better..."

Subject I noticed certain improvements in his own abilities:

A: "Have your, have you noticed any improvement in the way you've been walking?"

S1: Oh yeah. I can walk without the cane. I'll walk two rounds with the cane and then, uh, about three rounds without the cane.

A: Like you had mentioned before, you feel you're getting a little stronger anyways.

S1: Oh yeah, a lot stronger

A: That's good.

S1: My hand is way stronger."

In my observations of Subject I, both his cardiovascular endurance and his upper body strength were improving:

Nov. 10: "(Subject I) seems to be moving a bit faster and he's doing more laps (plus rowing, plus arm ergometer) than three weeks ago"

Jan 5: "Hip flexion when sitting still problem but extension, ab/adduction no problem. Knee flexion effort for L leg, good effort, R leg, full range of motion"

Feb. 16: "L knee flexion at 80 degrees, jerky movement. I spotted shoulder ab/adduction for L arm - anterior deltoid strong, medial and posterior deltoid weak. Held onto weight today"

Subject II did not ever consistently improve his physical abilities. Some days he was very attentive and made crisp, clean movements and had little trouble with his balance, and other days, he was very slow and limited in his movements. His nurse would always have to repeat the instructions made by the program leader and actively place Subject II's body parts in the correct starting position for each stretch or exercise. The following are a couple of my observations:

Dec. 8 "Pretty good use of arms on his own (this is an improvement!) eg. he can swim his arms or hold them over his head or in front of him in full extension"

Feb. 2 "(his nurse) was walking backwards holding both of his hands and they walked about ten feet and he "marched" about 20 more feet. He did a lot better than I've ever seen. He didn't lean as much or drag his right foot and he didn't step in front of his feet like he used to as much"

Mar. 2 "(Subject II) still same. (His nurse) puts him in correct position, and he does the exercise or stretch. He is now able to hold the stretch or do the whole set of exercises without letting up. He seems to be concentrating today"

Subject II felt that he improved in the following way:

A: Physically, do you feel it's helping you out, though?

S2: I think so.

A: Yeah. Do you feel any stronger do you think?

S2: I think I be stronger.

The program leader noticed some improvements in Subject II:

“(Subject II’s) walking ability - way better, balance way better, um you can see the improvement with him. He’s just doing a little more work.”

Subject III would not notice any difference in her physical abilities because she rarely attended the class. Subject III stated:

A: “...do you feel any different physically?

S3: I don’t think so.

A: Stronger, more flexible, anything like that?

S3: No.”

The leader had no comment on Subject III because she had not been to the class in three months. I did not have many comments written down about Subject III during my observations also because of her poor and sporadic attendance.

Dec.8: “can do all the exercises well...”

Jan. 5: “(Subject III) kind of tunes out. Only does a few repetitions or holds it (a stretch) less time than others. Getting in and out of chair - doesn’t go all the way down. upper body still weak but improving. Good bicep work”

Subject IV did not notice any improvements in his physical abilities:

A: “Do you feel different physically?

S4: Not really.”

“...I think I’m just maintaining well.”

The program leader stated:

“But (Subject IV’s) strength has improved. He’s lifting more weight.”

His wife did tell him that she noticed he seemed more flexible because on weekends when Subject IV used his manual wheelchair, he seemed to be pedalling with greater ease.

I agreed that Subject IV did not improve physically very much. He did get to the point where he was lifting more weight at the weight machines, but the class exercises

and stretches did not noticeably change.

Jan. 5 "good arm movement - almost full range of motion except left arm shoulder abduction. Just less than right arm"

Feb. 16 "Shoulders rolled back - no range of motion (partly because of chair). L arm lags - not as strong as right. Rest of arm exercises good. Shoulders still weak but endurance improving"

Mar.2 "No extension back at all - range of motion almost all at elbows - elbows always supported (resting) on sides

Some of the greatest improvements that I observed were in Subject V. He mentioned one improvement that he specifically noticed in himself:

"One thing is that I'm able to walk much further, so therefore I, I can - and I don't rely on a wheelchair anymore. My transportation is a combination of walking and my wife driving me to various social events."

The program leader was amazed at the improvements she saw after Subject V got his new volunteer:

"(Subject V) has improved! Phenomenally. He's able to walk with just assistance. without his cane. So balance has improved, strength is improved. flexibility is improved."

My observation notes revealed the following:

Dec. 22 "squats, bends at hips not at knees - low leg strength. L side, little improvement but leg exercises more efficient. No laps before or after"

Jan. 19 "good effort today with leg exercises - range of motion increased a few degrees"

Feb. 2 "walks upright, slightly drags left leg and leans on cane, but head up and back straight"

As stated above, most of the subjects in this study did find that they had improved physically at least to a small extent. The improvements largely depended

on the amount of effort they put into the exercises and how highly they were motivated to see some change.

Interestingly, some of the subjects attributed the physical improvements to the Nooners exercise class, but one subject did not. I would ask him in the mid-program interview whether he felt that the class was doing him any good. He was very quick to answer "No", and was attributing his improvements to his general recovery. He was just "getting better". On the other hand, Subject I felt very convinced that the Nooners was fully responsible for his increased abilities. He described the things he could now accomplish including carrying groceries and getting up and down the basement stairs with the laundry:

A: Do you attribute these changes to the program?

S1: Oh yeah.

A: So, would you recommend this program to any other people?

S1: Oh, definitely.

A: And why would you tell them to go?

S1: Oh, if they want to; they might not get perfect but it sure helps."

Social Interaction. For some of the participants, the social aspects of the class were almost as important as the physical aspects of class. The social atmosphere allowed for a break from the daily grind as well as a place to problem solve with others who were encountering similar obstacles in life. There was one subject who would tell his "joke of the day" and if he was missing from class on a certain day, the participants would really miss his jokes. Discussions ranged from the weather to families to teasing the program leader. The leader, volunteers and Nooner classmates would all participate in the conversations.

Because Subject I lived by himself, I imagine he benefited the most from the social atmosphere of the Reh-fit Centre. As stated earlier, he got into the habit of arriving 45 minutes before his class to visit with members and to help set up the class. He realized the social atmosphere was beneficial to him:



“For one thing, I got out for a couple of hours, or four hours a week or whatever. And, um, talk to different people...”

In the first mid-program interview, I asked if Subject I was enjoying the class. He told me the program is good because it gets him out of the house, and he's motivated to get up. He used to sleep in, but now he had to get up to go to class.

Subject II very briefly mentioned that he enjoyed the people in the class and the social events such as the coffee parties. He had constant companionship with his nurse or wife, and he had a lot of contact with his family even though some of them lived out of town. The social aspect was not as important to him as to some others. Subject III was in a similar situation. In class, she tended to socialize the most with her husband and rarely did she participate in group conversations. It may have been difficult for her because she may not have felt comfortable with the other participants since she did not see them very often. She was still actively socializing with friends outside of the centre and did not let her hip limit her social events.

Subject IV came armed with his “joke of the day” for the class. He often began the conversations and was almost always in a joking mood. He liked the social interaction the class provided, but it was not the main reason he came to the class:

“It was good fellowship which provided me with a good environment and I needed the discipline of knowing I'm coming at these times and I'm doing my thing.”

Subject V was not as comfortable as the others in terms of socializing in a group:

“...when I was there (at the Rehabilitation Hospital), there was a group program there as well. I, I didn't find it was all that useful, although others may have. All it, all it did for me was it kept reminding me that I was severely limited in my abilities, my physical abilities. ...it's very difficult, yeah, socializing with people who are having severe problems with which you are also having.”

He did contribute to the conversation once he felt more a part of the group. but

usually it was just an off-hand comment here and there. He did not initiate any conversations. Part of the problem may have been that his wife, when she was his volunteer, was very friendly and outgoing during the class. He may have felt overwhelmed by her.

The program leader felt that the social atmosphere was especially beneficial to the younger, professional participants in the class. Subjects 1, 4 and 5 were all working at the time of their impairments; they had a lot of life ahead of them when faced with a severe impairment. In the first update interview, the program leader and I discussed this aspect:

PL: "...he (Subject V) did enjoy the peer group. He did, he really liked the group that he's with. It just so happens that, you know, the guys get along really well.

A: I would guess that it's nice to have (Subject IV) here for him on an intellectual basis because they both work at the University. And (Subject I) here as a, someone else whose under the age of 60 who has had a stroke.

PL: Exactly. If they weren't here, he wouldn't be doing what he's doing. And their not working. He (Subject V) needs (Subject IV) because he's working, and he can look up to him."

Subject II did not tend to be outwardly social in class. He may have had a hard time communicating with people because he was so difficult to understand. Other classmates may not have made any effort for fear they could not understand him. The program leader noted:

"Socially, he's talking more. I see him interacting a little more with people."

The program leader and I both noticed that Subject III mainly interacted with her husband in the class. She was friendly, but did not initiate any conversations with other classmates.

As stated earlier, Subject IV was extremely friendly and outgoing. The program leader noticed this as well:

"Socially he's wonderful. He's really talkative, he's quite funny, he's got a good sense of humour, he used to have a joke everyday..."

Subject V's sociability improved as the class went on:

PL: "...he came in kind of withdrawn, and now, because of the good interaction and people are so positive in the group, they've brought that out in him. Socially he's a lot better. he talks, and he jokes, and he'll tell jokes, you know, which sometimes surprises me, but he does."

In summary, the social interaction in the class was a welcomed outlet for light conversation and joviality. Casual friendships were made, and for some, it gave them contact with others that they would not otherwise have in the day.

### Participation in the Program

Effort. While observing the classes, it was noted that some subjects were more highly motivated to improve their physical state than others. This was evident in the amount of effort the subjects put forward during the exercises. Some members pushed themselves to perform the exercises well and with increasing resistance, and others just "went through the motions". Even one of the subjects noticed this:

"...that (classmate), or whatever his name is, he does, he won't do nothing. Sits there. I don't know why he goes."

There was one day where Subject I had a bad cold. The nurse took one look at him and told him he wasn't to exercise that day. This was the only class that Subject I missed, and he was upset:

"Well I wanted, I wanted to exercise, I didn't want to go home."

I made an observation note on Nov. 24 about Subject I that read:

"The program is good because it gets him out of the house, motivated to get out"

and: (Subject I) "tries to get his affected arm right up to shoulder height. Definite improvement in movements. You can see effort with shoulder abduction - concentrates on movements"

There are three other comments on the amount of effort made by Subject I during the

exercise class observations. He was very highly motivated. The leader also noticed his effort:

“...he takes the effort to work at it. He works very, very hard.”

and:

PL: “Well, it’s just that I mean the class starts at twelve fifteen, he arrives here by eleven thirty, um he has equipment at home that he does besides coming here.

A: Mmhm.

PL: And, uh, just his motivation. he was , he was very active prior to his stroke and that’s why i think he, he would maintain it (an exercise program), because he knows what it’s like to be active and not active and very independent cause of, well, we all know he wants to remain independent.”

Subject II was also anxious to improve his walking ability and when he attended class, he also put in a lot of effort. The program leader stated:

“Um, he works really hard, um he takes the classes seriously - this is a workout, I’m here to workout, I’m gonna do it, uh, he is getting stronger and he’s, he’s definitely doing a lot more than he did when he came in.”

On the days that I observed his class, I found it very hard to discern the amount of effort put into his exercises:

Dec.22 “Not sure how much effort he is able to put into the exercises - he’s just going through the motion. No different facial expressions.”

Mar.2 “He seems to be concentrating today. You can’t tell how much effort is being made ie. does he feel the stretch?”

Subject III never worked very hard during the class. I suspect that she had never been involved in an exercise program before and did not know what exercise was supposed to feel like. She would withdraw after only a few repetitions because her arm got tired. Because of this habit, she never saw any real physical improvements. Her husband, who acted as her volunteer, was also very overprotective of her. If he saw her wince, he would encourage her to stop and rest.

rather than doing a few more repetitions of the exercise. My observation notes stated the following:

Dec.8 "(Subject III) can do all the exercises well, but if she feels any pain (even a bit tired) she drops her arm and doesn't keep working. Her husband asked if she was getting tired because she quit an arm exercise early. She said "No, but my shoulder is getting a little achy" so she stopped. He doesn't seem to encouraged her to work hard."

Both myself and the program leader found it hard to see any improvements or make any comments on Subject III because of her very low attendance at the Nooners classes. The program leader stated:

"She's, um, she's a real hard one to sort of evaluate, I find, um because. again, when someone is not there as often, you don't develop the same sort of relationship as someone who you see all the time."

The program leader agrees that her husband does not allow Subject III to push herself during the exercises:

"...she's the one that's wanting to do things, and he's the one that wants her to not push as hard."

I even made a note from one of the volunteers:

Mar. 2 "(the volunteer) made a comment as to how overprotected (by husband) (Subject III) is and how she needs a very minimal excuse not to come to class."

Subject IV was also highly motivated to be able to maintain any upper body strength and mobility he could because of his disability. The program leader stated:

"He really works hard. When he's out, he's out to work. he's not to just...he likes the social aspect, but he's here to work too. He really likes to push himself, he's good at doing that."

I would notice when Subject IV was working on the weight machines by himself, he

made a real effort to work hard. However, sometimes class was more of a social outlet. In my observation notes:

Mar. 2 "No effort in stretches - too busy talking? Social. I don't know how much physical improvements were made today because of the little effort made."

Subject V began the program with his wife as his volunteer. She really encouraged him to work hard in the class, but he resisted her encouragement. He made an off the record comment to me one day about her "being the boss". The program leader also noticed this:

"...he was sort of at a standstill for a while because it was more that he, he didn't want to work because his wife wanted him to work."

My observation notes on the amount of effort Subject V was making:

Dec. 22 "Little more effort made with the weights"

Jan. 19 "Good effort today with leg exercises. Range of motion increased a few degrees."

After the second month of the class, Subject V got a new volunteer. The program leader noticed that it made a real difference in his level of effort in class:

"He's working really hard. When he comes out, he's here to work. He's here to do a workout."

My notes reflected the same thing:

Feb.2 "(volunteer) is making him work and do every exercise...Really concentrating on doing each stretch. I was happy to see how hard he was working"

At the end of the study, it was very evident that the subjects who made the most amount of effort doing the exercises and stretches during the class made the most improvements.

It was very interesting to see that although the subjects' impairments were different, the barriers posed by the impairments, and the outcomes of the exercise program were remarkably similar between subjects.

### Quantitative Results

Three psychometric instruments were administered to the subjects at the initial interview, and at the post-intervention interview. They were used to determine whether there was a change in quality of life, self-esteem and self-efficacy as a result of the six month exercise intervention. The following pages briefly explain each psychometric instrument (a more in depth description can be found beginning on p. 43), what outcome was expected to occur, how each subject scored, and an explanation of why they may have scored that way. Table 4 shows each subject's scores on each of the psychometric instruments and the mean scores for each instrument. Because there were only five subjects, there were no inferential statistics completed on the data. Individual scores on each instrument were used as comparisons to themselves pre- and post-intervention.

Table 4. Scores on Psychometric Instruments.

Subject	MOS		Self-esteem		Self-efficacy	
	pre	post	pre	post	pre	post
1	38	35	4	4	20	18
2	39	64	2	1	12	10
3	54	63	5	5	20	4
4	44	39	3	2	17	5
5	38	42	5	4	12	10
Mean	42.6	48.6	3.8	3.2	16.2	9.4

#### The Short-form General Health Survey - Medical Outcomes Study (MOS).

This instrument was used to measure the individual's quality of life. The instrument has six scales which are: physical functioning, psychological functioning, social functioning, role functioning, health and pain. The highest possible total score is 100; higher scores indicating a higher quality of life. My hypotheses were that the

subjects would begin the study with a low quality of life because of low physical, social and role functioning due to their impairment(s), as well as a moderate to high degree of pain, psychological functioning, and low perceived health. I expected the Nooners program to improve the subject's physical abilities which would help with pain and improve their perceived level of health, as well as providing a social focus which would increase their psychological functioning. Figure 2 displays the MOS pre and post-intervention total scores for each subject while Table 5 presents the pre and post-intervention scores for the six sub-scales.

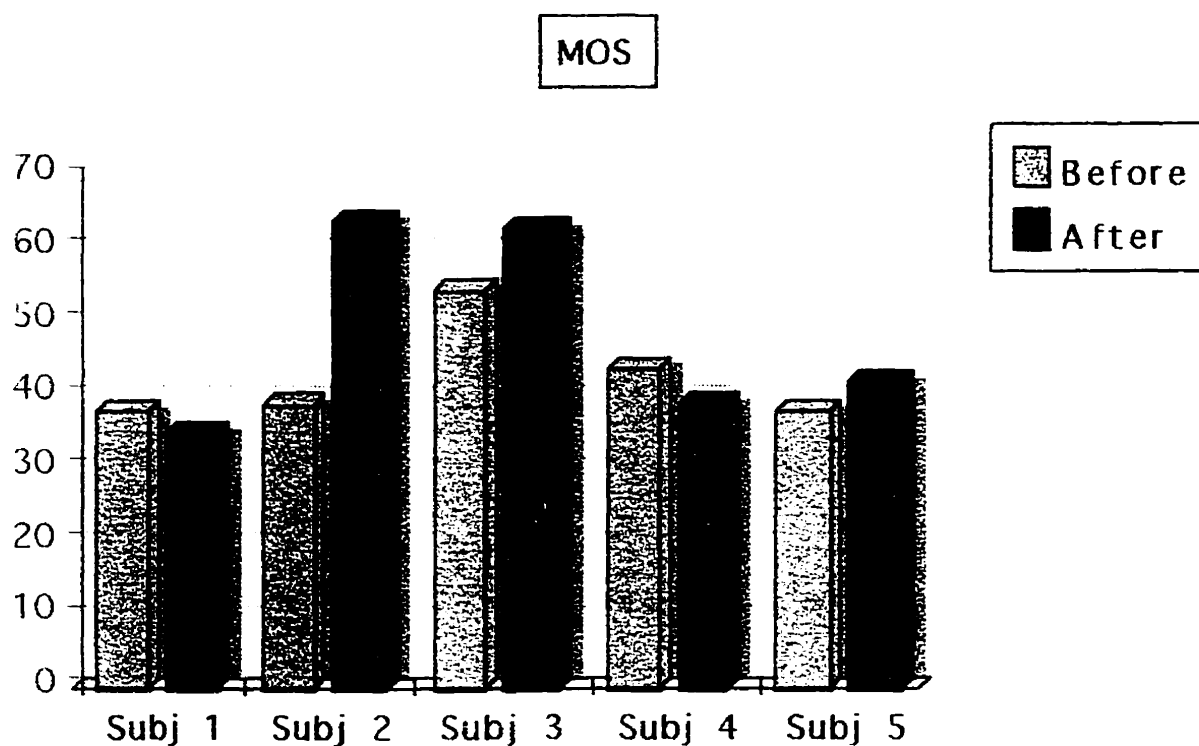


Figure 2. MOS scores before and after exercise intervention for each subject

Subject 1 began with a total score of 38 out of 100, and ended with 35 out of 100. I was surprised to see even this slight decrease in his score because he had become very social with the group, and he had greatly improved physically. His scores on the social and physical functioning scales did go up. However, his psychological functioning score decreased, and so did his health score. He may have



compared himself and his improvements to others rather than to how he functioned six months prior. On the health scale, he had initially responded "not sure" on two of the items. Perhaps he now had a greater degree of body awareness and was able to express his perceived level of health. On the psychological scale, he lived by himself and may have been lonely. He was also discouraged that he had not lost any weight which was a major goal.

Table 5. MOS subscale scores for each subject.

Subject	Physical		Psych		Social		Role		Health		Pain	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	6	8	12	9	2	4	2	2	14	10	2	2
2	6	12	17	24	4	4	2	2	8	19	2	3
3	12	12	19	25	6	4	2	4	13	16	2	2
4	6	6	19	15	4	3	4	6	8	7	3	2
5	7	10	15	16	2	2	2	2	9	10	3	2

\*Note: pain score reversed. Low score = More pain

Subject II's total score jumped from 39 in September to 64 when re-tested in April. Three scales showed great improvement (physical, psychological and health) while the other three remained identical or nearly identical. His walking had improved, but not to such a degree that his independence in walking would have significantly been affected. Psychologically, he may have found comfort in participating in an activity he did prior to his accident. Initially, Subject II may have had trouble understanding what was required in responding to the psychometric instrument questions. By the post-intervention interview, he may have felt more comfortable with both myself and the instruments, and therefore this may have had some effect on his scores.

I did not expect Subject III to change very much because of her very poor attendance and motivation, however her MOS total score did increase from 54 to 63.

The scales with the largest score differences were the psychological scale and the health scale. Her role score also increased by two points. Although no real physical improvements were observed, perhaps she did get some benefit from the class. For example, she answered that she was no longer limited to climbing one flight of stairs. She also found herself to be more calm and less "downhearted and blue" than six months before. Psychologically, she may have felt less dependent on her husband than before.

April may not have been a good time to re-test Subject IV who had just spent some time in the hospital and had not yet recovered. His total score dropped from 44 to 39. Five out of six scales had score changes, and four out of those five were negatively affected. The score on the psychological scale dropped four points which was understandable considering his recent hospital visit. He had a lot of work to catch up on after being away from his job for a few weeks, which may have made him anxious. The social and health scales both decreased by one point and the pain scale went from mild to moderate which can, again, be related to the recent time in hospital. The only scale which increased in score was the role scale. Subject IV no longer found he was limited in the kinds or amounts of housework he could do.

Subject V increased his MOS score from 38 points in September to 42 points in April. The increase in score was a result of a three point increase on the physical scale, and a one point increase on both the psychological and health scales. The pain scale increased from mild to moderate. The physical improvement was possibly the result of acquiring a new volunteer. The volunteer was strict on how Subject V performed his exercises, and motivated him to work harder than his previous volunteer. The volunteer had Subject V hold his head up which, in turn, improved his gait. The volunteer also made Subject V work his affected hand, which became much more functional than before. He may have felt better about himself when he noticed he could work harder and accomplish more. He also recorded that his health went

from “fair” to “good” and that he felt “down in the dumps” less frequently than he had in September. The program leader felt that, because Subject V had no children, his young volunteer filled a gap in his life that may have lifted his spirits.

Table 6 presents the mean scores of the subjects for each MOS subscale and the total score, and indicates the difference in the means. The mean total score increased by six points from pre to post-test. Four subscales (physical, psychological, role, health) showed increases while the social and pain subscales moderately decreased. The greatest increases were evident in the physical subscale followed by the health subscale. There was a substantial increase in the psychological subscale score as well. The social and role subscale scores only indicate small amounts of change because they were measured using only one item and therefore there is less room for improvement as compared to other subscales with more items.

Table 6. Mean scores for MOS subscales, total scores and differences

Physical		Psych		Social		Role		Health		Pain		Total	
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
7.4	9.6	16.4	17.8	3.6	3.4	2.4	3.2	10.4	12.4	2.4	2.2	42.6	48.6
Diff	2.2	Diff	1.4	Diff	-0.2	Diff	0.8	Diff	2.0	Diff	-0.2	Diff	6.0

### Rosenberg's Self-Esteem Scale.

This scale was used to measure the subjects' self-esteem. There are six scales, and the higher the number of “positive” scales, the lower the individual's self-esteem. The hypothesis was that the exercise program would improve their scores. Figure 3 presents the self-esteem scores for each subject before and after the exercise intervention.

Subject I did not have any change in his self-esteem scores - his level of self-esteem began and ended with four out of six positive scales. This indicated that he had a moderately low level of self-esteem throughout the data collection period. His

scores on specific items did actually change, for example, in April he saw himself as a person of worth when he did not in September. He was less satisfied with himself, he was not able to do things as well as most people, and he felt useless at times in the April scores. I thought that because the Nooners class had filled a void in his life physically, socially and emotionally, that his self-esteem would have increased.

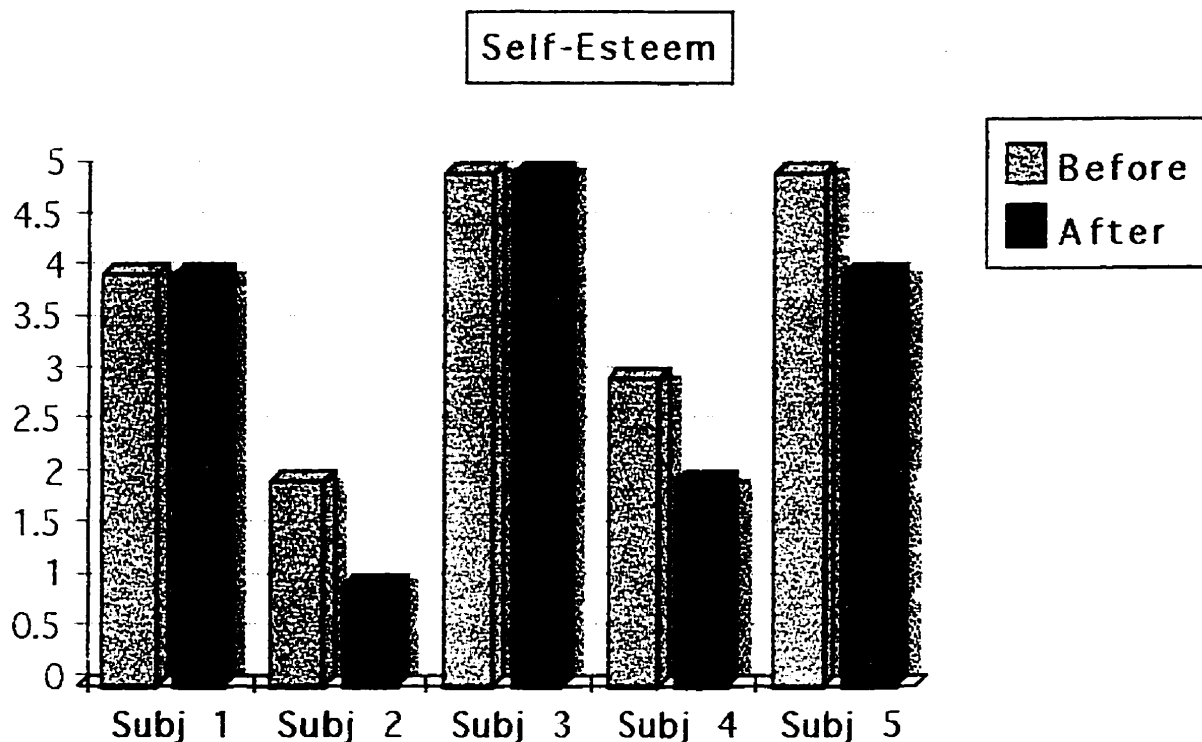


Figure 3 . Self-esteem scores before and after exercise intervention for each subject (lower scores indicate higher self-esteem)

Subject II had a high level of self-esteem to begin with and improved one scale. Two changes in his responses allowed him to improve his score. One response that changed was "I certainly feel useless at times" began with an "agree" response and in April was changed to a "disagree" response. The second was "I feel that I have a number of good qualities. His response in September was "Agree" and in April was "Strongly Agree".

Subject III's score on this scale was consistently five out of six "positive" scales

indicating a very low level of self-esteem. This was possibly because of how dependent she had become on her husband especially for household chores which used to be her main role in life. She made a couple of comments about how she felt she was a "burden" to him.

Subject IV improved in self-esteem from 3 to 2 "positive" scales, both scores indicating high self-esteem. The most marked change in response was in the statement "I am able to do things as well as most other people". In September, he strongly disagreed with this statement, but in April, he agreed. Subject IV was a very intelligent man. He had an extremely realistic view of himself. He responded to the items not in an emotional way, but in a practical and realistic way. For example, "I certainly feel useless at times" was a statement that he agreed with. Realistically, with the limited mobility he had, he might have felt useless.

Subject V also saw an increase in his self-esteem score from five to four "positive" scales. He still had a low level of self-esteem, but it was improving. His responses indicated that he felt less of a failure and he had a more positive attitude towards himself in April than he did in September. This may have been because of the change he noticed in his physical abilities. He was also working on a more regular basis, and may have felt he contributed more in his life than he had six months prior.

Overall, three subjects improved their self-esteem scores, and two maintained their score.

#### Self-efficacy Scale.

The Self-efficacy scale measured a subject's belief that they could exercise even if certain barriers got in their way. Possible scores ranged from 4 to 20 (high self-efficacy). Self-efficacy scores for each subject before and after the exercise intervention are presented in Figure 4. At the beginning of the exercise program, all of the subjects had high self-efficacy scores and all decreased in self-efficacy after the intervention. The mean scores also indicated that self-efficacy decreased.

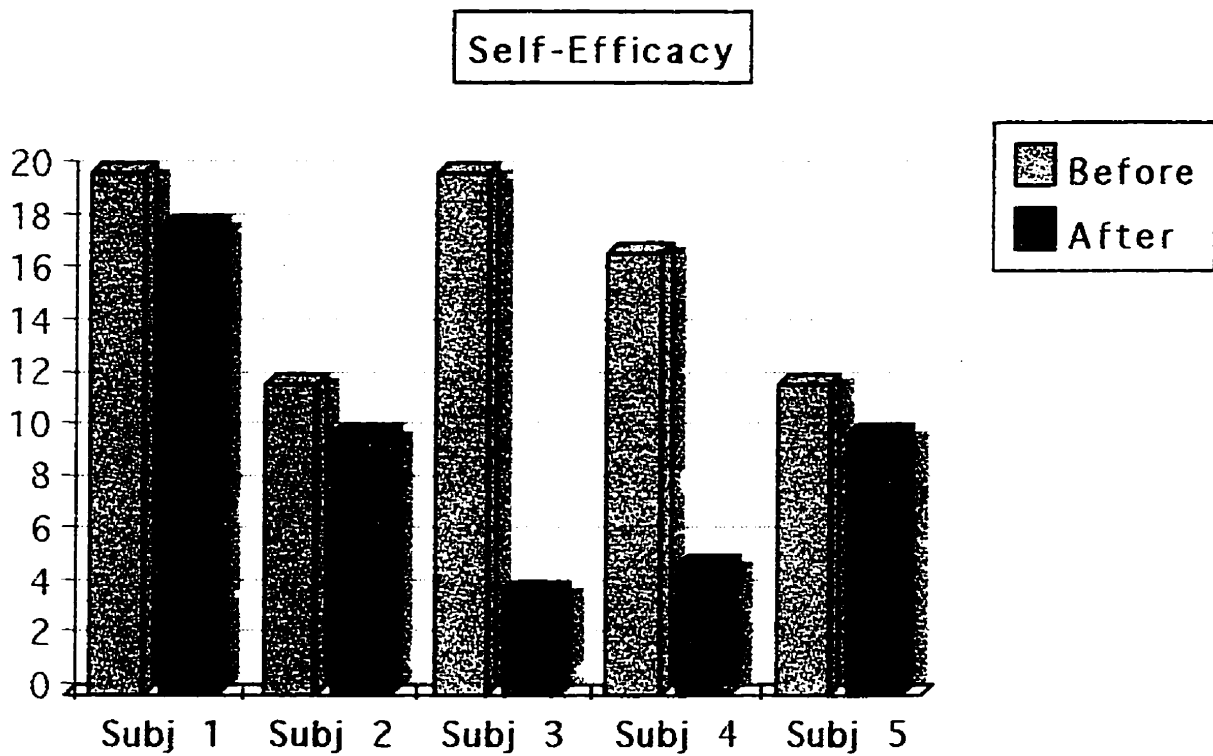


Figure 4 . Self-efficacy scores before and after exercise intervention for each subject

The most striking change was Subject III who scored the highest score possible (20) in September, and the lowest possible score (4) six months later. Subject IV also declined by 13 points. I believe this occurred because initially, Subject IV had tried to work in one extra day to come to the centre, and because of his schedule, he could not do it. His job and family took precedent over his extra day at the gym. He may have believed at first that an extra day was plausible, but in reality it was not.

All of the subjects' self-efficacy may have decreased because they may have come to realize what to expect from an exercise program, and that there might be barriers that would prevent them from exercising.

## CHAPTER FIVE

## DISCUSSION

This chapter highlights the relationship between the themes, relates the themes to the psychometric instruments, and compares the results to previous studies.

Relationships Between Themes

The seven themes relate to each other in several ways. For instance, the more effort a subject exerts in an exercise program, the more physical improvements they may experience. With higher levels of physical functioning, the subjects may become less dependent on others for activities of daily living. Once a subject becomes less dependent, they may find they have a lower level of depression because they are not always relying on others. With less depression, they may feel more like socializing, and social interaction with others may increase. If the subject has a high degree of support from friends and family for participating in an exercise program, they may put more effort into the exercises. Similarly, if the subject has high expectations that the exercise program will improve their physical functioning, they may also put forth a large degree of effort.

Conversely, some individuals (such as Subject V) were not comfortable in a group program. The one reason that surfaced in this study was that the group program served as a reminder that Subject V had a disability. Initially, he did not want to socialize with others who had impairments. He did not feel supported by the group, and did not make an effort to improve his physical functioning. The group format only heightened his depression because of the reminder that he had an impairment.

In general, exercise programs can have both positive and negative effects on people, and these affects interact with each other to either support or discourage participation in a program.

### Relationship of Themes to Psychometric Instrument Data

In order to triangulate the data for reliability, and to draw conclusions for the study, the psychometric data were compared to the interview and observation data. For the first instrument, the MOS, the data from each subscale were used for comparison. Following the MOS are discussions on the self-esteem and self-efficacy scales.

#### Medical Outcomes Study Short-form General Health Survey (MOS)

The MOS consisted of six subscales (see Table 5). The scores for each subject on the first subscale, "Physical Functioning", indicated that physical function was either maintained or improved during the intervention. This subscale also had the largest mean increase of the six subscales. The results support the Physical Improvements theme. Although two subjects did not feel that they had improved physically as a result of the Nooner's class, three felt that they had improved. The observations made by myself, and the leader's comments agreed. For example, Subject I was not able to grip a one pound dumbbell at the beginning of the program. Six months later, I had noticed he no longer dropped the weight, and he told me that he was now able to hold the weight in his hand.

On the "Psychological Functioning" subscale, three subjects had improved scores (indicating a rise in psychological functioning), and two subject's scores decreased. The mean score among subjects indicated a moderate increase. Qualitatively, psychological functioning was hard to determine, yet two aspects, dependence and depression, were strong themes from interview and observation data. Subject I and Subject IV's MOS scores indicated lower levels of psychological functioning after the intervention. These scores are difficult to explain as neither subject was apparently depressed. At the time of the post-intervention interview, Subject IV had just spent time in the hospital and was not feeling very well and this could have influenced his score. Subject I, on the other hand, was not dependent on



anyone as he lived alone (although he had some Home Care) and could still drive a car. However, the loneliness could have influenced his score. When all of the subjects were asked how they felt emotionally, they all had difficulty answering as they were unsure how to express their feelings. In class, little emotionality was overtly evident. Overall, it was hard to determine if the data on the MOS "Psychological Functioning" subscale actually corresponded with subjects' true feelings.

The last three subscales from the MOS were not directly focused on during the interviews and observations. Subjects were not asked questions regarding their role functioning, general health or level of pain. The "General Health" and "Pain" subscale scores were also not easily observable outcomes with the subjects. Other than the occasional "wince" of pain during a specific exercise, pain that occurred on an ongoing basis was unobservable. Health scores decreased for two subjects indicating a lower rating of perceived health after the intervention. The scores for the remaining three subjects increased. "Pain" scores generally stayed the same for each subject.

#### Rosenberg's Self-esteem Scale

My hypothesis was that exercise would increase self-esteem. Subjects were taking control of their lives, and taking a more active role in their recovery by participating in an exercise program. The subjects would see/feel improvements in overall functioning and their self-esteem would rise. The results showed that Subject I and Subjects III's scores remained the same, Subject II, IV and V's scores decreased indicating a higher level of self-esteem at the end of the intervention. From my observations, all of the subjects except Subject III were impressed that they were able to participate in a whole class without being sore, improve the amount of weight they were using, or simply do a movement that they had not done before on their own. Since I did not directly ask participants whether or not they felt their self-esteem improved with the Nooners intervention, I could only rely on my observations to qualify their self-esteem scores. Many of the subjects expressed satisfaction in seeing little

improvements in their abilities. Subject II, for example, was able to walk with improved balance. He worked very hard on this ability, and it seemed to pay off. He was no doubt satisfied with his efforts that led to some progress in his gait. Subject IV was able to increase the amount of weight he was lifting using the weight machines, and was impressed that he could actually improve his upper body strength. There is no way of knowing if these were the reasons their scores increased, but they may have contributed.

### Self-efficacy Scale

The Self-efficacy scores were interesting: every subject's scores decreased from pre-intervention to post-intervention. My explanation for this is that subjects were excited about joining a new program and they had high expectations for their ability to adhere. Six months later, they knew what to expect as to program content, effort required, the benefits of the program, etc. and became more realistic about what it took to participate in an exercise program. In other words, it was harder to stick to an exercise program than they thought it would be. For instance, Subject III began with the highest possible score on this scale (20/20) indicating a high level of self-efficacy. At that time, she had every intention of participating fully in the class, but did not know what it would be like. She had never been a part of a structured class before. During the intervention, she was not a motivated participant, she did not adhere well to the program, and at post-intervention her score reflected the lowest possible score (4/20). It was very clear in my observations and in her comments that Subject III did not enjoy the class. This was reflected in her Self-efficacy score. On the other hand, Subject I was very highly motivated, believed strongly that the Nooners class would benefit him, and attended all but one class in the six months. His score also decreased in the post-intervention, but from 20/20, to 18/20. The one answer that changed was that he would no longer feel he could get up early, even on weekends to exercise.

In summary, most of the psychometric instrument data were similar to the outcome

of the interview and observation data. This leads to an increased confidence in the conclusions since the same information is reflected in three methods of data collection.

### Comparison to Other Studies

#### Quality of Life

Rejeski, Brawley & Shumaker (1996) reviewed several articles on the effect of exercise on quality of life. They found that overall, physical activity was associated with improved quality of life regardless of age, fitness level, or health of the subjects (including chronically limited populations). Gauvin and Spence (1996) support the notion that exercise has the capability of improving quality of life. Similarly, in the present study, quality of life increased among subjects in general with three subjects increasing their quality of life, and two slightly decreasing.

Stewart, King & Haskell (1993) used the MOS to determine what quality of life benefits were obtained with regular exercise programs. They evaluated 12 month group- and home-based programs of both high (73-88% peak heart rate) and low (60-73% peak heart rate) intensities. Their subjects were healthy 50-65 year olds unlike the subjects in the present study. They found that greater levels of endurance exercise over the 12 month period were significantly associated with better ratings of physical health. In this study, Subject I came to all but one class and saw some significant improvements in his physical functioning in terms of affected arm range of motion, strength and grip. Subject V also saw improvements in his gait and stamina. He attended most of the Nooners sessions, but also attended an exercise class twice weekly at the Pan Am Pool. Subject III saw no change in physical function and she rarely attended the Nooners classes. In Stewart, et al's 1993 study, there was no association found between exercise and psychological functioning for any exercise format. Again, this was similar to the present study where self-esteem and self-efficacy scores on the psychometric instruments did not increase very much over the six-month

intervention period.

Ahlsio, Britton, Murray and Theorell (1984) found that quality of life deteriorated with an increased level of disablement after a stroke. Neither age, sex nor social factors were found to significantly affect quality of life - only the physical functioning factor. In the present study, this was certainly true. Physical improvements of the subjects were small. Since the subjects had the expectation that their physical functioning would improve, when this didn't occur to their satisfaction, quality of life did not increase very much.

### Self-esteem

As stated in the Review of Literature section, there are no studies on the effects of exercise on self-esteem of individuals with chronic physical impairments. With generally healthy middle aged and older adult subjects, self-esteem has been shown to increase with exercise participation (Gauvin & Spence, 1996; Doan and Scherman: 1987; Hughes, 1984; and Folkin and Sime, 1981). McAuley, Mihalko & Bane (1997) studied sedentary middle aged (50-65 yrs) adults after a 20 week aerobic exercise program. They found a significant improvement in self-esteem. In the present study, self-esteem scores increased for three subjects, and stayed the same for the other two.

### Self-efficacy

There are no studies on the effects of exercise on self-efficacy of individuals with chronic physical impairments. In Gauvin & Spence's (1996) article, they concluded that there is usually a moderate increase in self-efficacy in older adults who have participated in exercise programs. Hogan and Santomier (1984) observed an increase in self-efficacy among older adults who participated in a five week swimming class compared to a control group. McAuley, Band & Mihalko (1995) had previously sedentary older adult subjects participate in a five month exercise program. They found that self-efficacy improved as a result of both long and short term bouts of exercise. This study does not concur with the conclusion in the literature - that

exercise improves self-efficacy in older adults. As discussed earlier, none of the subjects had participated in a structured exercise program in the past. I believe that they did not know what to expect from the program before they started attending, and once they found out what the program entailed, their self-efficacy scores decreased. In other words, they no longer expected to be able to keep exercise as a high priority in their lives putting it ahead of family, sleep and other commitments.

In summary, quality of life and self-esteem score outcomes were consistent with the literature, but self-efficacy outcomes were not. Future studies need to involve subjects with chronic physical impairments in order to better understand how this population can increase the quality of their lives including improving their self-esteem and self-efficacy levels.

## CHAPTER SIX

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study investigated the effect of a six month exercise intervention on the quality of life, self-esteem and self-efficacy of older adults with chronic physical impairments. Five subjects from an exercise class at the Kinsmen Reh-fit Centre were recruited as a convenience sample. Data collection included pre and post-intervention interviews with the subjects and the class leader, two mid-program interviews of the subjects at the four and six month mark, bi-weekly observations of the class by the investigator, and three psychological instruments administered to the subjects pre and post-intervention.

#### Conclusions from Case Studies

Case studies were developed for each subject using the interview data as well as the observation data and the leader's comments. The subjects in this study varied greatly in everything from their ages and impairments, to their past exercise experiences and participation in the program. Most were not very active in physical activity before they started the Nooners class. Their attitudes about exercise ranged from physical activity being an important aspect in life, to exercise not playing an important role because people in general are "too busy".

Overall, subjects enjoyed the program and liked each other's company, but were not sure what types of benefits they expected to see. The subjects' emotional and social functioning improved as indicated in the observation data, with one subject as an exception. Because the physical impairments were such a large factor in the subjects' lives, if they did not see a marked improvement in their physical health, they were less likely to perceive improvements in any other aspects of their life (social, emotional).

### Summary of Themes

Seven major themes emerged from the subject interview data, the program leader data and my observation data: dependence, depression, support, expectations, physical improvements, social interaction and effort. In most cases, the information given in the subject interviews was supported by the program leader and my observations. The exercise intervention had positive effects on some of the themes. Most subjects experienced physical improvements with the exception of Subject III who rarely attended. The more effort the subject put into the exercises, the more physical improvement occurred (Subjects I and IV exerted the most effort and experienced the largest physical improvements). Social interaction among the participants, volunteers and the program leader increased throughout the six months. Participants became supportive of each other and of the Nooners program. Families and friends continued to support the subjects for their participation. Most of the subjects remained dependent on others for some aspects of daily life but the level of dependence was lower for some subjects. For example, Subject I's grip was improved enough that he could do some of his own cooking. Finally, it was not possible to discern whether or not the subjects still experienced depression, but it was not evident during the observations.

### Summary of Psychometric Instruments

The mean total scores on the MOS instrument (measuring quality of life) increased with the greatest numerical changes occurring in the physical functioning and perceived health subscales. The subjects' expectations (obtained from the interviews) were that their physical functioning, not their psychological functioning, would improve. This was verified in the MOS scores. The mean self-esteem scores increased with subjects either improving or maintaining their scores. Self-efficacy scores decreased overall.

### Final Conclusions

In general, there were positive changes in the subjects. The main benefits were physical improvements, increased self-esteem and an increase in perceived health. I also feel that the subjects benefited from the social interaction.

However, there were also some negative aspects of the program. Some of the subjects had unrealistic expectations of what they would get out of the program. I also thought that self-efficacy would increase for the subjects when the opposite actually occurred. Subject V taught me that not everyone enjoys or benefits from group exercise programs.

I would recommend this exercise program without hesitation to anyone with a chronic physical impairment.

### Subject Follow-up

Six months after the exercise intervention was finished, three of the subjects (Subjects I, II and IV) were still attending the Nooners class. Subject III and Subject V did not return after the summer of 1995. To date, Subject II is still attending the program, but has seen no further improvement in his abilities. Subjects I and III have passed away, and Subject IV still comes to the Centre occasionally to do his own workout.

### Recommendations for Future Programs

My recommendations for future programs such as the Nooners are:

1. Train the volunteers. They need to know how to communicate effectively with the participants, and have a good understanding of the goals of the program. They also need to be familiar with the exercises to ensure proper techniques.
2. Do not have spouses volunteering. Spouses should be oriented to play a supportive role of the participant as they participate in an exercise program, however, they should not act as a volunteer. First, this can add to stress in that one person is



telling the other what to do. Second, it allows the spouse to have a break from their care-taking role.

3. Individualize some parts of the program since there are a variety of impairments.

Not all participants will do all of the same things.

4. Ensure the program is fun and innovative yet directly aimed at the improvement of activity of daily living skills.

5. Figure out ways to improve self-efficacy in classes by letting individuals know what benefits they can expect to get out of the program. Break exercise down into manageable goals to encourage motivation and adherence

#### Recommendations for Future Studies

It would be of interest to study a group of individuals that had recently had a impairment occur and follow them for a longer period such as 12-24 months to see if improvement in quality of life, self-esteem and self-efficacy would be observed. Any further research in this area should include a control group of subjects with similar impairments to use as a comparison. Perhaps different psychometric instruments would have been better indicators of changes in quality of life, self-esteem and self-efficacy with this population. Only the MOS had been used with a chronically impaired population. The last recommendation is that a larger study group would allow for more effective analysis of quantitative data, and the use of inferential statistical analysis.

## REFERENCES

Ahlsio, B., Britton, M., Murray, V., & Theorell, T. (1984). Disablement and quality of life after stroke. Stroke, *15*(5), 886-890.

Arndt, J., Bhasin, C., Brar, S., Habasevich, R., Jacobs, J., Tarbuck-Nelson, K., Schapiro, R.T., Selzer-Silverman, A., & Varno, J. (1991). Physical therapy. In: R.T. Schapiro (Ed.). Multiple sclerosis: A rehabilitation approach to management. (pp.17-66). New York: Demos.

Bandura, A. (1977). Social learning theory. Englewood Cliffs, NJ: Prentice-Hall.

Barry, H.C., Rich, E.S.E., & Carlson, T.R. (1993). How exercise can benefit older patients: A practical approach. The Physician and Sportsmedicine, *21*, 124-126, 129-134, 137-140.

Bermann, D. (1988). Psychosocial elements of head injury. In: K.M. Kovich & D.E. Bermann (Eds.). Head injury: A guide to functional outcomes in occupational therapy. (pp.35-44). Rockville, MD: Aspen.

Bowling, A. (1991). Measuring health: A review of quality of life measurement scales. Philadelphia: Open University.

Brown, D.R., Wang, Y., Ward, A., Ebbeling, C.B., Fortlage, L., Puleo, E., Benson, H., & Rippe, J.M. (1995). Chronic psychological effects and exercise plus cognitive strategies. Medicine and Science in Sport and Exercise, *27*(5), 765-775.

Burckhardt, C.S., Woods, S.L., Schultz, A.A., & Ziebarth, D.M. (1989). Quality of life of adults with chronic illness: A psychometric study. Research in Nursing and Health, *12*, 347-354.

Caine, D.J., & Bothwell-Myers, C. (1989). Preventing osteoporosis: The important role of the physical educator. CAHPER, *55*, 5-10.

Canadian Fitness and Lifestyle Research Institute. (1994). Exercise, anxiety and depression. The research file, 1163.

Carroll, D.L., & Dorman, J.D. (1993). Living well with MS: A guide for patient, caregiver and family. New York: HarperPerennial.

Cella, D.F. (1992). Quality of life: The concept. Journal of Palliative Care, *8*, 8-13.

Charette, S.L., McEvoy, L., Pyka, G., Snow-Harter, C., Guido, D., Wiswell, R.A., & Marcus, R. (1991). Muscle hypertrophy response to resistance training in older women. Journal of Applied Physiology, 70(5), 1912-1916.

Cohen, C.I., Teresi, J., & Holmes, D. (1985). Social networks, stress, and physical health: A longitudinal study of an inner-city elderly population. Journal of Gerontology, 40, 478-486.

Doan, R.E. & Scherman, A. (1987). The therapeutic effect of physical fitness on measures of personality: A literature review. Journal of Counseling and Development, 66, 28-36.

Emery, C.F., & Blumenthal, J.A. (1990). Perceived change among participants in an exercise program for older adults. The Gerontologist, 30, 516-521.

Fallowfield, L. (1990). The quality of life: The missing measurement in health care. London: Souvenir (E & A).

Ferrini, A.F., & Ferrini, R.L. (1989). Health in the later years. Dubuque: Wm. C. Brown.

Folkens C.H. & Sime, W.E. (1981). Physical fitness training and mental health. American Psychologist, 36, 373-389.

Foster, V.L., Hume, J.E., Byrnes, W.C., Dickinson, A.L., & Chatfield, S.J. (1989). Endurance training for elderly women: Moderate vs. low intensity. Journal of Gerontology, 44(6), M184-M178.

Gauvin, L., & Spence, J. (1996). Physical activity and psychological well-being: Knowledge base, current issues and caveats. Nutrition Reviews, 54(4), S53-S65.

Gecas, V. (1989). The social psychology of self-efficacy. Annual Review of Sociology, 15, 291-316.

George, L.K., & Bearon, L.B. (1980). Quality of life in older persons: Meaning and measurement. New York: Human Sciences.

Gerhardt, U. (1990). Qualitative research on chronic illness: The issue and the story. Social Science in Medicine, 30, 1149-1159.

Gill-Body, K.M., & Giorgetti, M. (1995). Acute care and prognostic outcome. In: J. Montgomery (Ed.). Physical therapy for traumatic brain injury. (pp. 1-32). New York: Churchill Livingstone.

Gorden, R.L. (1980). Interviewing: Strategy, techniques and tactics (3rd ed.). Ontario: Dorsey.

Grembowski, D., Patrick, D., Diehr, P., Durham, M., Beresford, S., Kay, E., & Hecht, J. (1993). Self-efficacy and health behaviour among older adults. Journal of Health and Social Behaviour, 34, 89-104.

Heitmann, H.M. (1986). Motives of older adults for participating in physical activity programs. In: B.D. McPherson (Ed.). Sport and aging - The 1984 Olympic Scientific Congress Proceedings, Vol. 5. (pp. 213-214). Champaign, IL: Human Kinetics.

Hogan, P.I., & Santomier, J.P. (1984). Effect of mastering swim skills on older adults' self-efficacy. Research Quarterly for Exercise and Sport, 55(3), 294-296.

Horner, P. (1989). Osteoporosis the long road back: One woman's story. Ottawa: University of Ottawa.

Hughes, J.R. (1984). Psychological effects of habitual aerobic exercise: A critical review. Preventive Medicine, 13, 66-78.

Kenyon, G.S. (1968). Conceptual model for characterizing physical activity. Research Quarterly, 39, 96-105.

Kerson, T.S. & Kerson, L.S. (1985). Understanding chronic illness: The medical and psychosocial dimensions of nine diseases. New York: Free Press.

Kovich, K. & Bermann, D. (1988). Handling and facilitation of functional movement. In: K.M. Kovich & D.E. Bermann (Eds.). Head injury: A guide to functional outcomes in occupational therapy. (pp.69-106). Rockville, MD: Aspen.

Leith, L.M. & Taylor, A.H. (1989). Psychological aspects of exercise: A decade literature review. Journal of Sport Behavior, 13, 219-235.

Mathes, S.A., & Battista, R. (1985). College men's and women's motives for participation in physical activity. Perceptual and Motor Skills, 61, 719-726.

McAuley, E. (1994). Physical activity and psychosocial outcomes. In C. Bouchard, R.J. Shephard, & T. Stephens (Eds.). Physical activity, fitness and health: International proceedings and consensus statement. (pp.551-568). Champaign, IL: Human Kinetics.

McAuley, E., Bane, S.,M., & Mihalko, S.L. (1995). Exercise in middle-aged adults: Self-efficacy and self-presentational outcomes. Preventative Medicine, 24(4), 19-28.

McAuley, E., Lox, C., & Duncan, T.E. (1993). Long-term maintenance of exercise, self-efficacy and physiological change in older adults. Journal of Gerontology, 48(4), 218-224.

McAuley, E., Mihalko, S.L., & Bane, S.M. (1997). Exercise and self-esteem in middle-aged adults: Multidimensional relationships and physical fitness and self-efficacy influences. Journal of Behavioural Medicine, 20(1), 67-83.

McDowell, I., & Newell, C. (1987). Measuring health: A guide to rating scales and questionnaires. New York: Oxford University.

Meenan, R.F., Gertman, P.M., & Mason, J.H. (1980). Measuring health status in arthritis: The arthritis impact measurement scales. Arthritis and Rheumatism, 23, 146-152.

Molyneaux, D., & Lane, V.W. (1982). Effective interviewing: Techniques and analysis. Boston: Allyn and Bacon.

O'Brien, S.J. & Vertinsky, P.A. (1991). Unfit survivors: Exercise as a resource for aging women. The Gerontologist, 31(3), 347-357.

Palys, T. (1992). Research decisions: Quantitative and qualitative perspectives. Toronto: Harcourt Brace Jovanich.

Patton, M.Q. (1980). Qualitative evaluation methods. London: Sage.

Pearlman, R.A., & Uhlmann, R.F. (1988). Quality of life in chronic diseases: Perceptions of elderly patients. Journal of Gerontology, 43, M25-30.

Pilisuk, M., Montgomery, M.B., Parks, S.H., & Acredolo, C. (1993). Locus of control, stress, and social networks: Gender differences in the health status of the elderly. Sex Roles, 28, 147-166.

Psychology Position Statement (1992). Physical activity and psychological benefits. The Physician and Sportsmedecine, 20(10), 179-184.

Rea, L.M., & Parker, R.A. (1992). Designing and conducting survey research: A comprehensive guide. San Fransisco: Jossey-Bass.

Rejeski, W.J., Brawley, L.R., Shumaker, S.A. (1996). Physical activity and health-related quality of life. Exercise and Sport Sciences Reviews, 24, 71-108.

Rodin, J. (1986). Aging and health: Effects of the sense of control. Science, 233, 1271-1276.

Rosato, F.D. (1990). Fitness and wellness: The physical connection (2nd ed.). St. Paul: West.

Rosenberg, M. (1965). Society and the adolescent self image. New Jersey: Princeton University.

Sallis, J.F., Hovell, M.F., Hofstetter, C.R., Faucher, P., Elder, J.P., Blanchard, J., Casperson, C.J., Powell, K.E., & Christenson, G.M. (1989). A multivariate study of determinants of vigorous exercise in a community sample. Preventive Medicine, 18, 20-34.

Schapiro, R.T. (1991). Multiple Sclerosis: A rehabilitation approach to management. New York: Demos.

Shephard, R.J. (1993). Exercise and aging: Extending independence in older adults. Geriatrics, 48, 61-64.

Sonstroem, R.J. (1984). Exercise and self-esteem. In: R.L. Terjung (Ed.), Exercise and Sport Science Reviews, 12, pp.123-15. Lexington, MA: Collamore Press.

Stenback, A., Kumpulainen, M., & Vauhkonen, M.L. (1978). Illness and health behavior in septuagenarians. Journal of Gerontology, 33, 57-61.

Stewart, A.L., Greenfield, S., Hays, R.D., Wells, K., Rogers, W.H., Berry, S.D., McGlynn, E.A., & Ware, J.E. (1989). Functional status and well-being of patients with chronic conditions: Results from the Medical Outcomes Study. Journal of the American Medical Association, 262, 907-913.

Stewart, A.L., Hays, R.D., & Ware, J.E. (1988). The MOS Short-form General Health Survey: Reliability and validity in a patient population. Medical Care, 26, 724-735.

Stewart, A.L., & King, A.C. (1991). Evaluating the efficacy of physical activity for influencing quality of life outcomes in older adults. Annals of Behavioral Medicine, 13, 108-116.

Stewart, A.L., King, A.C., & Haskell, W.L. (1993). Endurance exercise and health-related quality of life in 50-65 year old adults. The Gerontologist, 33, 782-789.

Thomas, J.R., & Nelson, J.K. (1996). Research methods in physical activity, (3rd ed.). Champaign, IL: Human Kinetics.

U.S. Department of Health and Human Services. (1996). Physical activity and health: A report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

Wankle, L.M., Hills, C.A., Hudec, J.C., Mummery, W.K., Sefton, J.M., Stevenson, J., & Whitmarsh, B. (1994). Self-esteem and body image: Structure, formation and relationship to health-related behaviors. Technical Report to the Canadian Fitness and Lifestyle Research Institute., Ottawa: CFLRI.

Wenger, N.K. & Ferburg, C.D. (1990). Cardiovascular disorders. In: B. Spilker (Ed.). Quality of life assessments in clinical trials. (pp.335-345). New York: Raven.

Willis, J.D., & Campbell, L.F. (1992). Exercise psychology. Champaign, IL: Human Kinetics.

APPENDIX A  
INTERVIEW CHECKLIST

**Background Information**

age  
gender  
marital status  
living arrangements  
education  
employment

**Health**

information about the impairment  
history of the impairment  
feelings about the impairment  
effects of impairment on daily life  
social support

**Nooners Program**

reason for joining  
feelings about joining  
perceived benefits  
expected compliance  
perceived barriers  
involvement in other types of rehab  
involvement in physical activity  
attitude about physical activity  
perceived societal attitude about physical activity



APPENDIX B  
PRE-INTERVENTION INTERVIEW

-The information in the square brackets represents the area of information tapped by each question.

**I will begin by asking you some questions about yourself.**

1. What is your age? If you are not comfortable telling me your exact age, could you please give me a five year range, eg. 70-75.
2. WRITE DOWN GENDER
3. What is your current marital status? {Are you married, divorced, widowed, or single, never married?}
4. What is your current living arrangement. {Do you live alone, with your spouse, with family member(s), with friends, in a seniors complex, or in a nursing home?}
5. What was the highest level of education that you obtained? {Elementary school, some high school, grade 12, some university or college, or completed university or college?}
6. Are you employed? {full-time? part-time?}
7. What is/was your occupation?

[items 1 - 7 represent demographic information]

**Now I'm going to ask you some questions about your health:**

8. You are in this program because of some sort of physical impairment. Can you tell me what that condition is, and tell me a bit about it?
9. How long have you had (the condition)?
10. How did you feel (types of emotions) when you found out you had (suffered a stroke, been diagnosed with osteoporosis, had a heart attack,...)?
11. How has (having a stroke, heart problems, a hip replacement...) affected your day-to-day life? [items 8 - 11 tap susceptibility to, and severity of illness]
12. How have people treated you since you had your (stroke, hip replacement...)? [social support]
13. Has this support been satisfactory to you? [social support]

**Now I have some questions about entering the Nooners program:**

14. Why did you decide to join this program? [motivation] (referred?!)
15. What do you hope to get out of this program? [benefits]

16. How do you feel about entering the program? [attitude]
17. How do you get to the program? {taxi, Handi-transit, ride...} [barrier/social support]
18. How many times a week do you expect to come out to the program?  
[adherence]
18. What types of things would prevent you from coming out to the program?  
[barriers]
19. Are you involved in any other rehabilitation-type programs besides the Nooners program? [isolate effects of Nooners program]
20. What types of sports or physical activities were you involved with in the last three years? [history of participation in physical activity]
21. How do you feel about physical activity? [attitude]
22. How do you think society feels about physical activity? [perceived social norm]
23. Has anything affected the quality of your life recently, other than your CPL?  
(events, changes, situations?)

## APPENDIX C

POST-INTERVENTION INTERVIEW

## General Questions

## ATTENDANCE:

1. How frequently did you attend the program?
2. How many classes did you miss?
3. How did you get to the program?
4. What were the reasons that you did not attend?
5. Is there anything that would have helped you attend more classes?
6. How long do you plan on continuing with the program?

## ENJOYMENT/BENEFITS:

7. Have you enjoyed the Nooners program?
8. What did you like the most / least?
9. Were there any benefits that you expected to get out of the program that haven't occurred?

## STRUCTURE OF THE PROGRAM:

10. Do you think the Nooners is a valuable program?
11. Are there any changes you would like to see in the way the program was organized and run?
12. What do you think about the contribution of the volunteers to the class?
13. How did you like the social aspects of the class ie coffee parties...?
14. How did you like the atmosphere of the program (music, line dancing, crowds)?

## EFFECT OF PROGRAM ON SUBJECT'S LIVES:

15. Have you noticed any differences in your day to day activities? Have other people noticed any differences?
16. Have you noticed any physical changes since starting the program? Mental?
17. Has your social life changed?
18. Do you think the Nooners program has changed the quality of your life?

## SOCIAL SUPPORT:

20. How did your friends and family feel about your participation in the program?

## OTHER:

21. Have you been involved in any other therapies?
22. How did the Nooners contribute to your improvement in the past six months compared to the other therapies?
23. Has anything significant affected the quality of your life in the past six months?
24. Would you recommend this program to others?
25. has the program changed the way you feel about physical activity?

## SPECIFIC QUESTIONS:

## Subject I:

1. Do you find that you can do more around the house?
2. Are you still doing your exercises at home? What are they?
3. How many laps did you walk around the track before and after class?

## Subject II:

1. Do you have any trouble seeing the leader?
2. How long did you spend doing cardio, and what activities did you do?

## Subject III:

1. Did the news about your daughter affect the quality of your life?
2. Have you increased the weight or reps in the weight exercises that you do?  
What exercises and what is your routine?
3. How long did you usually spend on the arm ergometer before class?

## Subject IV:

1. Did you find that the exercises caused you pain?
2. Was your spouse supportive of your participation in the class?
3. Did you spend any time walking around the track, on the bikes or arm ergometer?

## Subject V:

1. Have you enjoyed working with your new volunteer?
2. How many laps did you usually walk before and after class? Did you spend any time on the arm ergometer?

## APPENDIX D

MID-PROGRAM INTERVIEW

(November &amp; February)

1. How are you enjoying the program?
2. Do you feel any differences physically? mentally? socially?
3. Have you noticed any differences in your daily activities? Are things easier or harder than they were three months ago?
4. How do you feel right after each class?
5. How do your family and friends feel about your participation in the program?
6. Is there any part of the program that you would like to see changed?

## APPENDIX E

SHORT-FORM GENERAL HEALTH SURVEY MEDICAL OUTCOMES STUDY

**Please circle or put a checkmark beside the answer that most closely represents your feelings. Please answer all of the questions. If you do not understand a question, ask the researcher for clarification.**

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

- a) excellent
- b) very good
- c) good
- d) fair
- e) poor

2. How much bodily pain have you had during the past four weeks?

- a) none
- b) very mild
- c) mild
- d) moderate
- e) severe

3. For how long (if at all) has your health limited you in each of the following activities: (check one line in each row)

	Limited for more than 3 months	Limited for 3 months or less	Not limited at all
a) The kinds or amounts of vigorous activities you can do such as lifting heavy objects, running or participating in strenuous sports?	_____	_____	_____
b) The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries, or bowling?	_____	_____	_____
c) Walking uphill or climbing a few flights of stairs?	_____	_____	_____
d) Bending, lifting or stooping?	_____	_____	_____
e) Walking one block?	_____	_____	_____
f) Eating, dressing, bathing, or using the toilet?	_____	_____	_____

4. Does your health keep you from working at a job, or doing work around the house?

- a) Yes, for more than 3 months
- b) Yes, for 3 months or less
- c) No

5. Have you been unable to do certain kinds or amounts of work, or housework because of your health?

- a) Yes, for more than 3 months
- b) Yes, for 3 months or less
- c) No

For each of the following questions, please check the line for the one answer that comes closest to the way you have been feeling during the past month.

(check one line in each row)

	A Good			A		
All of the Time	Most of the Time	Bit of the Time	Some of the Time	Little of the Time	None of the Time	
1	2	3	4	5	6	

6. How much of the time, during the past month, has your health limited your social activities?  
(visiting with relatives, or friends)

\_\_\_\_\_

7. How much of the time, during the past month, have you been a very nervous person?

\_\_\_\_\_

8. During the past month, how much of the time have you felt calm and peaceful?

\_\_\_\_\_

9. How much of the time, during the past month, have you felt downhearted and blue?

\_\_\_\_\_

10. During the past month, how much of the time have you been a happy person?

\_\_\_\_\_

11. How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?

\_\_\_\_\_

12. Please check the box that best describes whether each of the following statements is true or false for you. (check one line in each row)

	Definitely True 1	Mostly True 2	Not Sure 3	Mostly False 4	Definitely False 5
a) I am somewhat ill	_____	_____	_____	_____	_____
b) I am as healthy as anybody I know	_____	_____	_____	_____	_____
c) My health is excellent	_____	_____	_____	_____	_____
d) I have been feeling bad lately	_____	_____	_____	_____	_____



## APPENDIX F

SELF-ESTEEM

**Directions:** Below you will find some statements about yourself. We would like to know how you feel about each statement. There are no right or wrong answers. Read each statement carefully and circle the number which best expresses your feeling about the statement.

	Strongly Agree 1	Agree 2	Disagree 3	Strongly Disagree 4
1. On the whole, I am satisfied with myself.	1	2	3	4
2. At times, I think I am no good at all	1	2	3	4
3. I feel that I have a number of good qualities.	1	2	3	4
4. I am able to do things as well as most other people	1	2	3	4
5. I feel I do not have much to be proud of.	1	2	3	4
6. I certainly feel useless at times.	1	2	3	4
7. I feel that I am a person of worth, at least on an equal plane with others	1	2	3	4
8. I wish I could have more respect for myself.	1	2	3	4
9. All in all, I am inclined to think that I am a failure.	1	2	3	4
10. I take a positive attitude about myself.	1	2	3	4

APPENDIX G  
SELF-EFFICACY

**Directions:** Circle how sure you are that you can do the following things. For each item, circle whether you know you can do it, might be able to do it, or know you cannot do it.

	Know I Cannot		Maybe I Can		Know I Can
1. Get up early, even on weekends to exercise.....	1	2	3	4	5
2. Exercise even though you are feeling sad or highly stressed.....	1	2	3	4	5
3. Stick to your exercise program even when your family or friends demand more time of you...	1	2	3	4	5
4. Stick to your exercise program even when you have a lot of work to do.....	1	2	3	4	5

APPENDIX H  
CONSENT FORM

The purpose of this study is to examine the quality of life, self-esteem and self-efficacy of older adults with chronic physical impairments before and after a six month exercise intervention.

If you agree to participate in this study, your involvement will consist of filling out four short questionnaires and being interviewed for one approximately one hour before the exercise program begins (September, 1994), and again six months later (March, 1995). The interviews will be tape recorded. All the information collected will be kept strictly confidential and will only be seen by the researcher.

I \_\_\_\_\_ understand the purpose of the study and agree to participate in it. I recognize that my participation is voluntary and that I may withdraw from the study at any time.

Signature \_\_\_\_\_

Date \_\_\_\_\_

## APPENDIX I

INTRODUCTION TO THE INTERVIEW

My name is Andrea and I am working on my Master's degree in the Faculty of Physical Education and Recreation Studies at the University of Manitoba. This study fulfills the requirements for my Master's Thesis. I will be interviewing participants in the new Nooners program and asking that they take the time to fill out three short surveys.

The study should provide some information on how exercise affects the quality of life, self-esteem and self-efficacy of older adults as well as giving the Reh-fit Center some feedback about their program.

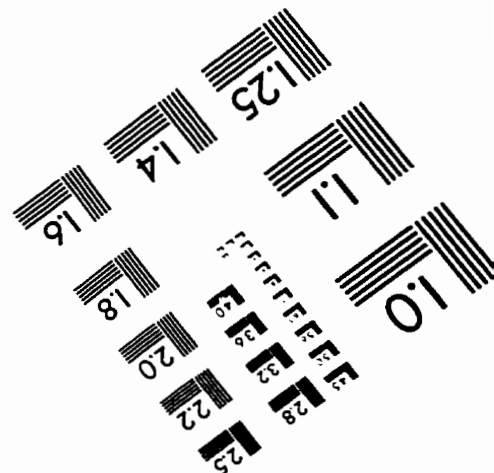
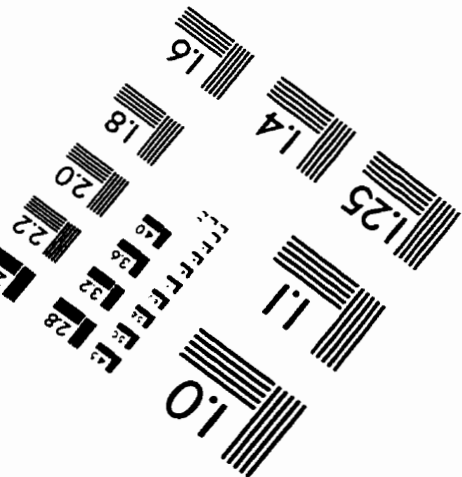
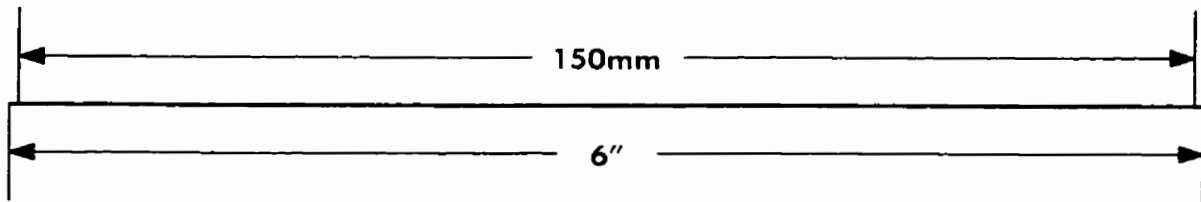
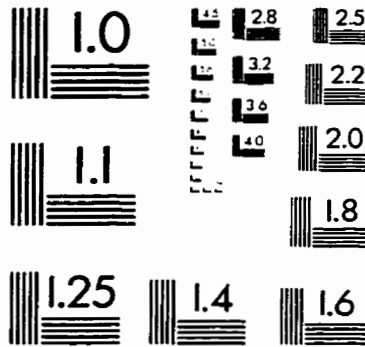
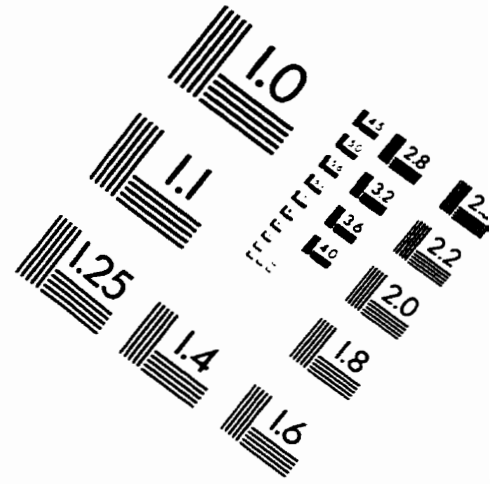
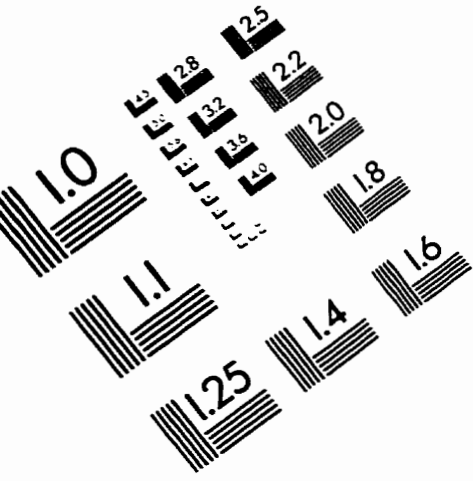
For ethical reasons I must ask you if you agree to be interviewed. I would like to tape-record this interview to help make sure I get everything that you say, and I wouldn't want to waste any of your time writing everything down. Do you mind if I record the interview?

In the interview I will be asking you questions about your health, and your reasons for being in the Nooners program. The surveys deal more with general questions about your life and your perceptions about exercise.

I want you to know that you don't have to answer any questions that you are not comfortable with. However, I really appreciate your time and I hope you will feel comfortable talking with me.

We will begin with filling out the surveys. Do you have any questions before we start?

# IMAGE EVALUATION TEST TARGET (QA-3)



APPLIED IMAGE, Inc  
1653 East Main Street  
Rochester, NY 14609 USA  
Phone: 716/482-0300  
Fax: 716/288-5989

© 1993, Applied Image, Inc., All Rights Reserved