Does Physical Activity at a Younger Age Reduce the Likelihood of Fails in Seniors?

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Abstract

Purpose

Falls are a significant cause of death and disability and have a serious impact to the psychological and physical health of the elderly. The purpose of this research study was to determine if physical activity reduces the likelihood of falls in seniors living in long term care facility. The main objective of the study was to examine the association between an individual's history of physical activity throughout their pastime, to determine whether involvement in physical activity at a younger age can be a determinant of the likelihood to incur a debilitating fall at an older age. The research was conducted on seniors currently aged seventy and older who reside at the Specialty Care Mississauga Road long term care center located in Mississauga, Ontario.

Methods

This study used a retrospective cohort approach to determine the association between the physical activity at younger age and incidence of falls as documented in the fall risk assessment tool. A mail-out questionnaire was used to collect information on levels of past physical activity, periods of involvement in sport, and specific lifestyle behaviors. One hundred and sixty resident family members were asked to complete the questionnaire, providing specific information based on their loved one's history. A total of 84 questionnaires were completed and returned.

Data Analysis

The data that were collected from the fall risk assessment and questionnaire were entered into standard database for subsequent statistical analysis. The information from the two data sets (i.e retrospective physical activity profile and the falls risk assessment) were merged together to evaluate the research question using correlation procedures.

Results

Pearson product moment correlation coefficient scores were computed using SAS to determine the relationship between the physical activity scores and fall risk assessment scores. The results indicated that there was no correlation between the two scores, in either the total group or the separate sub-groups created for age.

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you have made over the years to help me discover my dream and for always pushing me to do

my best. Every move I make, every step that I take, every race I win, everything I do,

I owe it all to you.

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INTRODUCTION

Does physical activity at a younger age reduce the likelihood of falls in seniors? To answer this question, one must determine whether involvement in physical activity at a younger age is associated with incidence of falls at an older age. Falls are among the most common and serious problems facing the elderly (Halil et al., 2006). The fall-related injury rate is nine times greater among seniors than among those less than sixty-five years of age (Public Health Agency of Canada, 2005). It is estimated that sixty-two percent of injury-related hospitalizations for seniors are the result of falls (Public Health Agency of Canada, 2005). Further, it has been reported that patients with dementia are sixty percent more likely to fall (in a given year), which is twice the rate of falls in cognitively intact patients in long term care facilities (Vassallo et al., 2006). Moreover, approximately one-quarter of patients with dementia who fall sustain a fracture (Vassallo et al., 2006). Women over the age of eight-five years are eight times more likely to fall when compared to women aged between sixty-five to seventy-fours years (Stevens & Olson, 2000), and elderly women are at great risk of falling when compared to men of a similar age (Stevens & Olson, 2000).

Falls are the second leading cause, after motor vehicle collision, of injury-related hospitalization for all ages, accounting for twenty-nine percent of injury admissions (Public Health Agency of Canada, 2005). Fall and fall-induced injuries in the elderly are common not only in North America but internationally (Kannus, 2005). In Canada, falls are the sixth leading cause of death among the elderly (Nursing Best Practices Guidelines, 2002), and it has been reported that thirty-three percent of older adults fall each year, and thirty-six percent develop serious injury. Finally, some forty percent of admissions to nursing homes are the result of falls (Nursing Best Practices Guidelines, 2002).

The cause of falls among seniors are numerous, yet we do know that older adults are more likely to have weaker muscles, poor vision, decreased sensation, poor balance and other medical conditions that make them more likely to fall and with more debilitating consequences (Halil et al., 2006). Older adults may not be aware of the risk of falling and may not recognize the risk factors which lead to a fall (Halil et al., 2006). Risk factors are categorized into two distinct groups: extrinsic and intrinsic factors. Extrinsic factors are a direct result of one's environment such as improper footwear and unstable living conditions such as uneven flooring and staircase climbing, whereas intrinsic factors consist of those factors related to the physical changes associated with aging such as vision impairments, incontinences, and medication use (Lajoie & Gallagher, 2004). Other intrinsic factors include loss of balance, postural instability neurological disabilities, and muscle weakness (Lajoie & Gallagher, 2004). Previous research reported that both intrinsic and extrinsic factors are equivalent in predicting the likelihood to fall (Lajoie & Gallagher, 2004). Within nursing homes for the elderly, as well as in long term care facilities multiple fall risk factors have been identified (Lajoie & Gallagher, 2004). Some of these risk factors include slippery surfaces, stairs, and use of seating in bathtub and/or showers, walk-ways and dirt paths around the facility and provision of bathroom and laundry facilities on same level of bedroom, living room and kitchen (Lajoie & Gallagher, 2004).

Postural control has been a leading factor in predicting falls in the elderly population (Lajoie & Gallagher, 2004). Balance posture is important in accomplishing a wide variety of daily tasks such as cleaning the kitchen and walking around the house (Lajoie & Gallagher, 2004). Restorative aid walking programs have been successfully implemented in long term care facilities and retirement homes to improve balance and muscle strength in the elderly (Lajoie & Gallagher, 2004).

The outcome of a fall can cause numerous setbacks including long term pain, functional impairment, disability, and death in the elderly population (Kannus, 2005). Bone fractures are a major concern among the elderly (Stevens et al., 1997). Almost half of seniors who fall experience a minor injury, and five to twenty-five percent sustain injury such as a fracture or a sprain (Public Health Agency of Canada, 2005). It has been reported that falling causes more than ninety percent of all hip fractures in seniors and twenty percent die within a year of the fracture (Public Health Agency of Canada, 2005).

The Importance of Physical Activity

What do we know about physical activity and risk of falling? It has been reported that physical activity may reduce the risk of factures due to falling by preventing and reducing bone loss at all ages, increasing muscular strength, and improving balance, flexibility, coordination, and reaction time (Stevens et al., 1997). A fall or even the fear of falling can cause social withdrawal and loss of independence. Even the admission to a long term care facility can lead to depression and anxiety (Kannus, 2005). Falls that do not lead to injury often begin a downward spiral of fear that can lead to inactivity and decreased strength, agility and balance that often results in loss of independence in normal activities of self care (Southard et al., 2005).

Aging is associated with a decrease in the quality of balance regulation which is an important factor in the risk of falling (Gauchard et al., 2003). One of the best defenses against possible hazards that accompany aging is exercise (Gauchard et al., 2003). In a study completed by Gauchard et al. (2003) it was found that moderate physical activity as well as specific sporting activities improved posture (Gauchard et al., 2003). A number of studies have shown that physical functions such as strength, gait, and balance can be improved in older adults through regular exercise (Cochrane et al., 1998). In a recent article written by Gauchard et al.

(2003) it was reported that physical activity in mid-age (forty-five to sixty-five) improves gaze and posture control in the elderly. Aging is associated with a decrease in the quality of balance regulation, gaze control and postural stabilization, which may result in an increased risk of falling (Gauchard, et al., 2003). In a study by Gauchard et al. (2003) to assess the effects of the practice of physical activities on vestibulospinal reflex and ocular movements of visual and vestibular origins in the elderly (Gauchard, et al., 2003), the authors reported that regular physical activity develops and maintains the efficiency of the reflexes involved in postural control (Gauchard, et al., 2003). The participants for this study included only twenty-six women over the age of sixty years (with a mean age of 72) and excluded male participants. This study has limits in the sample population, however of those studied, it was concluded that physical activity plays a beneficial role in the quality of life in elderly women, particularly by increasing postural control, and thus reducing falls.

Similarly, a case-control study by Stevens et al. (1997) examined the association of vigorous and mild physical activity with fall-related fractures in a community-dwelling population age sixty-five and older in South Florida. Vigorous physical activity was defined as exercising, heavy house cleaning or other hard labor three or more times a week; mild exercise was defined as the number of hours a day the participants reported spending time on their feet (Stevens et al., 1997). It was found that physically active seniors were less likely to sustain a fall-related fracture than were the inactive ones (Stevens et al., 1997). These results suggest that vigorous physical activity is associated with a lower fracture risk among elderly persons (Stevens et al., 1997).

Likewise, in a study by Faber et al. (2006) the researchers examined the effects of exercise programs on falls and mobility in frail and pre-frail older adults. This study intended to

determine the effects of moderate intensity group-exercise programs on falls, functional performance, and disability in older adults; and to investigate the influence of frailty (Faber et al., 2006). Two hundred seventy-eight men and women were involved in the study. The intervention consisted of two exercise programs that were randomly distributed across fifteen homes (Faber et al., 2006). This study found that fall-preventative moderate intensity group exercise programs have positive effects on falling and physical performance in pre-frail, but not in the frail elderly (Faber et al., 2006).

Moreover, in the general population, physical activity has been shown to reduce risk factors of falling such as osteoporosis, non-insulin dependent diabetes, colon cancer, hypertension, and obesity; and has a benefit effect on anxiety and depression (Lim et al., 2005). Physical activity is generally associated with the following positive outcomes: improved physical health; support to disease prevention, control or management; improved mental health; enhanced mental and social well-being; increased autonomy and independence (Canadian Fitness and Lifestyle Research Institute, 1995). Physical activity plays a role in healthy aging as it acts as a core element to positive health-promoting behaviours (Canadian Fitness and Lifestyle Research Institute, 1995). A randomized study completed by Lim et al. (2005) found that high-intensity resistance exercise was found to improve muscle strength and mobility in frail elderly people. Regular practice of soft gymnastics and bio-energetic activities can improve postural control in the elderly (Lim et al., 2005). Chronic inactivity has been linked to negative health outcomes such as premature death, chronic disease, illness and disability, as well as reduced independence and high risk of injury (Canadian Fitness and Lifestyle Research Institute, 1995).

Greater than one third of adults aged sixty-five years or older fall each year (Hornbrook et al., 1996). The prevention of falling in long term care facilities is a challenging aspect of care,

not only because of the high number of falls, but because of the effect on residents, families, staff and administration (Taylor, 2002). A fall poses a significant societal burden. Over $980 million of the $2.4 billion spent on falls in Canada (2004) was devoted to treating falls among the elderly (Nursing Best Practices Guidelines, 2002).

Why Conduct Research on Falls?

Reducing the incidence and prevalence of falls among the elderly may lead to a decrease in morbidity and mortality among seniors, and may thereby reduce the economic burden on health care costs. The Public Health Agency of Canada estimates that a twenty percent reduction in falls would translate to an estimated 7,500 fewer hospitalizations and 1,800 fewer permanently disabled seniors (Public Health Agency of Canada, 2005). The overall national savings in Canada would amount to $138 million annually (Public Health Agency of Canada, 2005). The investigation of falls among seniors has increased three hundred percent from the years between 1985 and 2005 and continues to be on a rise (Public Health Agency of Canada, 2005). The Canadian Fitness and Lifestyle Research Institute (1995) estimates that a reduction of ten percent in physical inactivity among Canadians would result in saving of five billion in discounted lifetime costs for medical care, sick leave and lost revenues from taxes resulting from premature mortality (Canadian Fitness and Lifestyle Research Institute, 1995).

Falls are a significant cause of death and disability and have a serious impact on the psychological and physical health of the elderly. A large proportion of the elderly population does not engage in sufficient levels of physical activity to maintain a healthy lifestyle (Active Living Coalition for Older Adults, 1999). It has been reported that older adults represent the most sedentary proportion of adults: activity decreases with the increase of age (Active Living Coalition for Older Adults, 1999). There is a reduction of physical activity between the ages of

fifty-five and seventy-five or older age groups that has shown a decrease in quality of life and an increase in falls and injury (Active Living Coalition for Older Adults, 1999).

Research has tried to estimate the frequency of physical activity at an older age using different approaches and results in similar findings (Active Living Coalition for Older Adults, 1999). According to the Canada's Physical Activity Guide to Healthy Active Living for Older Adults, sixty percent of older adults are not sufficiently active to achieve optimal full health benefits. As reported in the National Population Health Survey (1999) it was estimated that fourteen percent of seniors are active, twenty-one percent moderately active and sixty-five percent inactive (Health Canada, 1999). This document also reports that inactivity levels increase from fifty-nine percent for adults fifty-five to sixty-five years of age to sixty percent for seniors sixty-five to seventy-four years of age to seventy-four percent for seniors seventy-five or older (Health Canada, 1999). In 1999, statistics Canada reports that thirty-two percent of seniors have low frequency of physical activity, while the Canadian Fitness and Lifestyle Research Institute reports that twenty-eight percent of seniors have low energy expenditures which is associated with an increase in falls and decreased quality of life (Health Canada, 1999). Based on findings from previous research, there appears to be a need to determine if physical activity at a younger age reduces the likelihood of falls in seniors living in a long term care facilities.

Statement of the Problem

The purpose of this research study was to determine if physical activity reduces the likelihood of falls in seniors living in long term care facilities. The main objective of the study was to examine the association between an individual's history of physical activity throughout their lifetime, to determine whether involvement in physical activity at a younger age can be a determinant of the likelihood to incur a debilitating fall at an older age. The study was designed

so that the researcher could collect data from a nursing home/long term care facility that was accessible to her (Specialty Care Mississauga Road, Mississauga, Ontario).

The research hypothesis is that one may expect a lower incidence of falls among individuals that report a greater involvement in physical activity, and especially recreation/sport related physical activity.

The study recognized that involvement in physical activity may have been limited as a result of many known barriers (time, access, equipment, skill, and socio-economic status). However, as for socio-economic status as a known limitation on the observed results, it may be that SES was less important as the residents living at Specialty Care Mississauga Road are responsible for covering their accommodations at this location which is a privately owned facility (Specialty Care Mississauga Road, 2007). An accommodation of a private room is $2091.45 per month and a shared accommodation is $1543.95 per month. Few residents are covered by government funding.

Eighty percent of residents at Specialty Care Mississauga Road are women. Women over the age of eight-five years are eight times more likely to fall compared to women aged sixty-five to seventy-fours years (Stevens & Olson, 2000). Elderly women are at greater risk of falling than men (Stevens & Olson, 2000). This evaluation may be associated with the high probability of developing osteoporosis, a disease that weakens bone structure, thus resulting in greater chance of falling (Osteoporosis Canada, 2007).

Glossary of Terms

Fall- is defined as a sudden and unintentional change in position resulting in an individual landing at a lower level such as on an object, the floor, on the ground, with or without injury (Public Health Agency of Canada, 2005).

Physical Activity- Physical activity consists of athletic, recreational or occupational activities that require physical skills and utilize strength, power, endurance, speed, flexibility, and range of motion (National Athletic Trainers Association, 2002).

Methodology

This research study was conducted on seniors currently aged seventy and older who resided at the Specialty Care Mississauga Road long term care facility located in Mississauga, Ontario. A physical activity questionnaire was used to collect information on levels of retrospective physical activity, periods of involvement in sport, and specific lifestyle behaviors. An examination of the fall risk assessment currently used in the facility provides essential data on history of falls within the last six months, medication use, memory and recall ability, vision patterns, incontinence in the last fourteen days, agitated behaviour in last seven days, confinement to a chair, blood pressure, and gait analysis. The current study used a retrospective cohort approach to determine the association between the physical activity at younger age and incidence of falls as documented in the fall risk assessment.

The Setting

Specialty Care Mississauga Road is a family-owned company which has provided long term care and retirement living to Ontarians since 1977. This facility is located in Mississauga, Ontario which is close to both highway 403 and the Credit Valley Hospital. Specialty Care

Mississauga Road provides a home for one hundred and sixty residents with an average age of eighty-eight years and includes two locked units for residents with Dementia, Alzheimer Disease or a combination of conditions. Currently, there are approximately thirty percent of residents with mild or advanced Dementia.

Exercise programs include full-time restorative care (walking program), foot care, and physiotherapy classes. Nurses, personal support workers and other medical staff have created a fall prevention committee at Specialty Care Mississauga Road that is lead by the Associate Director of Care.

Research Design, Instruments and Data Collection

A retrospective cohort approach was used to determine the association between physical activity at a younger age and incidence of falls as documented in the fall risk assessment. The Specialty Care Mississauga Road fall risk assessment was used to collect information about falls on each resident in this study. The fall risk assessment outlined medical details on: reason for assessment, request date of admission, history of falls within last six months, medication use, memory and recall ability, vision pattern, in-continence in last 14 days, agitated behaviour in last seven days, wheelchair use, blood pressure, gait analysis. The number of monthly falls at Specialty Care Mississauga Road were tracked provided by the fall prevention committee team. Specialty Care Mississauga Road was given information regarding the purpose of the data collection and subsequent details on the research.

The researcher intended to identify the level and occurrence of physical activity among long term care residents according to reports from family members completing a retrospective physical activity profile survey. Specialty Care Mississauga Road currently houses one hundred and sixty residents. One hundred and sixty family members received the physical activity

questionnaire. Current residents of Specialty Care Mississauga Road did not participate directly in any of the data collection.

The ethics committee at Lakehead University and Specialty Care head office approved the present study. The appropriate officials at Specialty Care Mississauga Road also approved the study. It was expected that an individual (a guardian/family member) could complete the questionnaire in approximately thirty minutes. The physical activity questionnaire was mailed to one hundred and sixty potential participants (family members of residents). The physical activity questionnaire included questions related to the resident's involvement in physical activity, sport and specific lifestyle behaviors between the ages of fifty and sixty-five. An introductory letter was also included to provide information about the reason for the study, what was expected and researcher's contact information. Instructions were provided on the questionnaire to ensure that the participants understood how to complete the questionnaire, the time to complete the questionnaire and procedures to return the information to the researcher. The participants were given a stamped return envelope addressed to the researcher. The questionnaire was expected to be returned within two weeks. A copy of the introductory letter, participant consent form, fall risk assessment consent form and the physical activity questionnaire are included in appendix A, B, C and D.

Statistical Approach

The retrospective physical activity questionnaire consisted of 8 pages of forty-five questions. Each question used either a nominal or ordinal scale to evaluate outcome. All medical risk factors of each resident were used in the description of falls reporting. The data that were collected from the fall risk assessment and questionnaire were entered into standard database for subsequent statistical analysis. The information from the two data sets (i.e retrospective physical

activity profile and the falls risk assessment) were merged together to evaluate the research question using correlation procedures. The data from the fall risk assessment at Specialty Care Mississauga Road was collected by the researcher and was kept confidential by the use of a locked cabinet located in the researcher's office.

Results

Demographics

From the physical activity questionnaire 27% (n = 22) of participants were male and 73%

(n = 62) were female. The average age of participants was 85.3 ± 7.08 years. Computation of the

95% confidence interval for age showed a range of 83.8 to 86.8 years. The current study had a

response rate of 53% for the physical activity questionnaire and an injury rate of approximately 1

to 2 hospitalizations a month according to the assessment documentation. A break down of

participants by age and gender with respect to the main response scores is presented in Table 1,

below.

The following section describes the results for the responses to the fall risk assessment—

a computerized surveillance and monitoring program which provides descriptive information

about each patient in the long term care facility—the responses to the retrospective physical

activity survey—a questionnaire completed by the participant's family member or guardian—

and the relationship between the falls risk estimates and physical activity profiles.

Table 1: Summary Table of Average Scores by Gender

| Variable Measured	Average Score (± std) Total Sample	Average Score (± std) Males	Average Score (± std) Females
Age	Mean = 85.3 Std = 7.08 N = 82	mean =82.8 std =8.19 n_1= 21	mean =86.3 std =6.52 n_2= 60
Falls Risk Assessment Score	Mean =14.12 Std = 6.13 N =77	mean =20 std =3.28 n_1= 22	mean =11.7 std =5.42 n_2= 54
Physical Activity Score	Mean= 78.26 Std = 6.35 N = 84	mean =80.63 std =6.50 n_1= 22	mean =77.5 std =6.16 n_2= 61

Fall Risk Assessment

The fall risk assessment outlined the following: reason for assessment, date of admission, history of falls within last six months, medication use, memory and recall ability, vision pattern, in-continence in last 14 days, agitated behaviour in last seven days, wheelchair use, blood pressure, and gait analysis.

The reason for assessment, as indicated from the summary statistics, showed that 6% of individuals had experienced a recent fall, 5% were a new admission to the centre, and 88% were classified as an "other" request. Eighty-seven percent of individuals had an admission date over three months and 13% had an admission less than three months.

On average, there were 30.25 falls per month at Specialty Care Mississauga during 2006. As illustrated in Figure 1, more falls were observed during the month of January (approximately 42 falls) while the month of June showed fewest number of falls (approximately 13 falls). The highest number of residents who fell (28 residents) at Specialty Care Mississauga Road was reported in September 2006. The lowest reporting of residents who fell (11 residents) was in June (See Figure 2). The summer months of June, July and August had fewer falls per month when compared to winter months of January, February and March 2006.

Figure 1: Total Number of Falls that Occurred Within Each Month
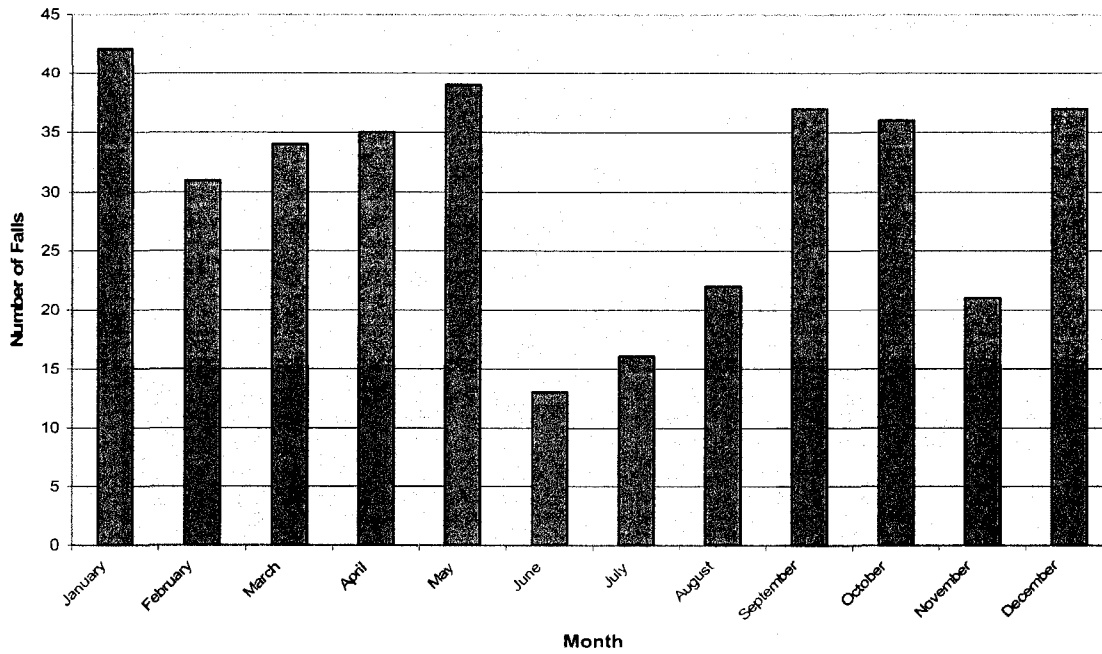
Figure 2: Number of Residents Who Fell Each Month
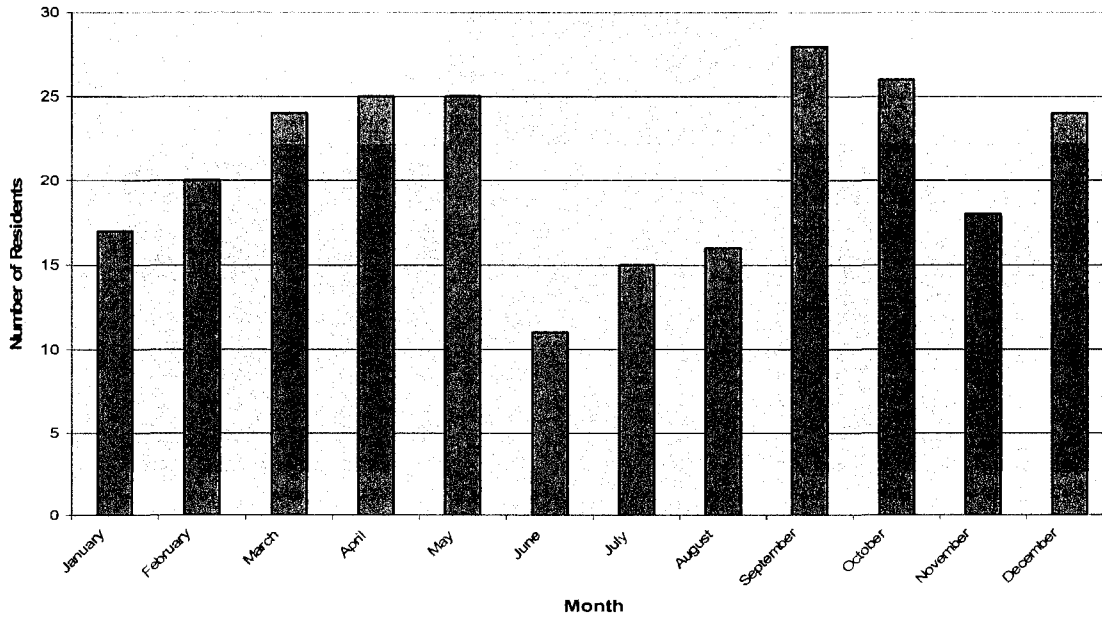
The number of individuals in this cohort exhibiting falling behaviour is illustrated in

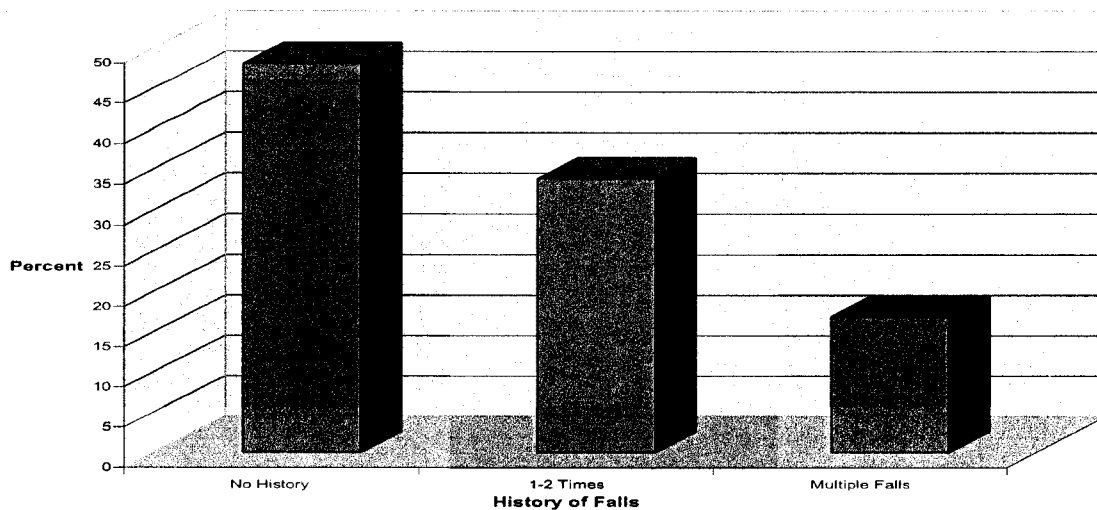Figure 3. The data show that 48% of individuals had no history of falling while 34% fell at least

1-2 times and 17% were reported to have fallen multiple times. A positive fall history in the

preceding six months of a fall is a strong predictor of future falls (Improving Senior Care, 2006).

Figure 3: History of Falls Within Last Six Months

The fall risk assessment identified about 13 different medications (taken more than three

times per week) these are listed as antihistamines, diuretics, hypoglycemic agents,

antiseizure/antiepileptic, antihypertensive, NSAIDs, benzodiazepines, narcotics, psychotropic,

anti-Parkinson, cathartic's, sedatives/hypnotics, if medication and/or dosage has changed in last

five days.

It was reported that no respondents were taking antihistamine medication. Twenty six

percent of individuals were reported to be taking diuretics, 12% of individuals were reported to

be taking hypoglycemic agents and .06% of individuals were reported to be taking anti-

seizure/antiepileptic, 61% of individuals were reported to be taking anti-hypertensive

medication, 19% of individuals were reported to be taking NSAID'S, 0.05% of individuals were

taking benzodiazepine's, 12% individuals were taking narcotics, 51% of individuals were taking

psychotropic's, 10% of individuals were taking anti-parkinson's, 10% of individuals were taking cathartic's, and 25% of individuals were taking sedatives/hyponotic's. It was reported that only 1% of individual's medication and/or dosage was changed in the last five days of when the assessment was taken. The results show that antihypertensive medication was commonly used among the residents at Specialty Care Mississauga Road.

The number of individuals in this cohort exhibiting memory and recall ability within the last seven days of the assessment is illustrated in Figure 4. The data show that 18% of individuals never remember, 57% sometimes remember, and 25% always remember.

Figure 4: Memory and Recall Ability in the Last Seven Days When Assessment was Taken
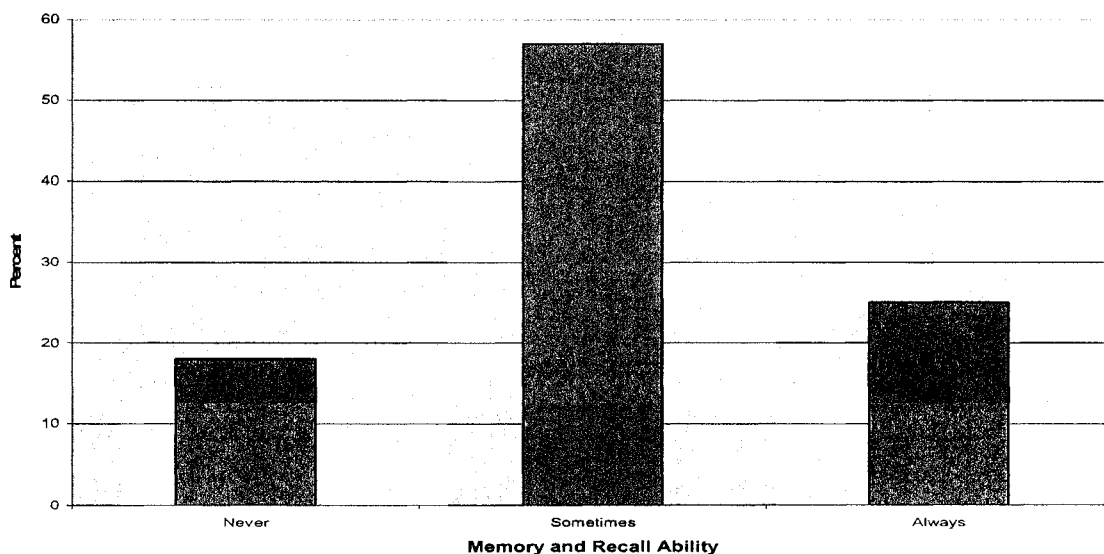
Note: In the last seven days: recalls three out of four of the following; current season, that he/she is in a nursing home, location of room, staff names/faces.

The data also show that 89% of individuals had adequate vision patterns. That is being able to see in adequate light with glasses on. Six percent of individuals had inadequate vision patterns, those who had impaired vision in adequate light with glasses on. Five percent of individuals had severely impaired vision patterns, those with no vision or sees only light, colour or shape (See Figure 5).

Figure 5: Resident Vision Patterns

Legend:
- Adequate
- Inadequate
- Severly Impaired
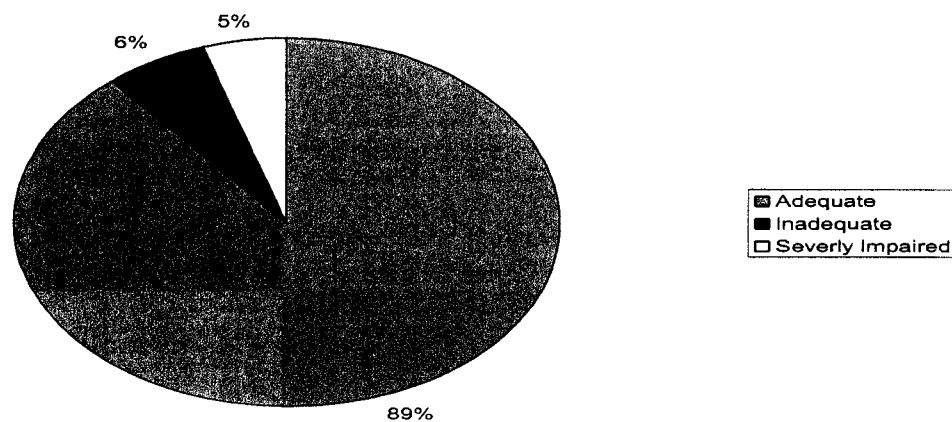
Twenty-seven percent of individuals experience complete continence control and the same percentage of individuals experience frequent incontinence. Twenty-two percent of individuals experience occasional incontinence and 23% of individuals experience total incontinence (Figure 6).

Figure 6: Continence in Last 14 Days
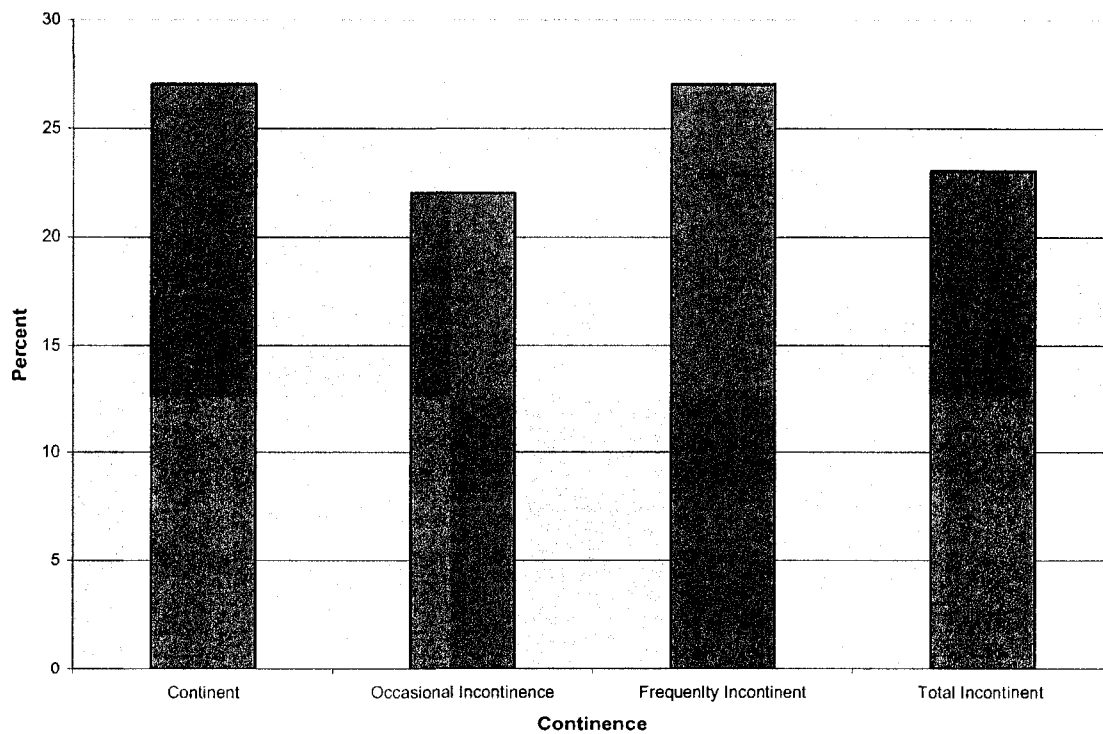
A significant loss of cognition can result in lack of understanding and awareness, need for assistance, judgmental errors and behavioural problems such as agitation, aggression, restlessness and wandering (Improving Senior Care, 2006). Fourteen percent of individuals in this cohort exhibited agitated behaviour including wandering, were verbally abusive, physically abusive, and demonstrated socially inappropriate behaviour including being noisy, screaming, disrobing, being self-abusive, rummaging, and hoarding occurring daily or more. It was reported

that 57% of individuals did not have agitated behaviour and 28% of individuals had agitated

behaviour occurring less a daily (See Figure 7).

Figure 7: Agitated Behaviour in Last Seven Days
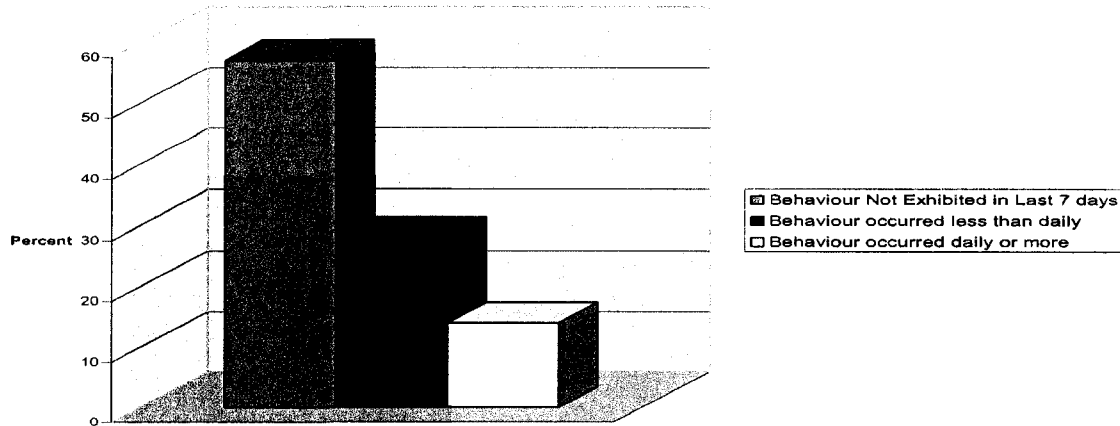
As illustrated in Figure 8, twenty-two percent of the individuals in this cohort used a wheelchair

and were cognitively oriented and 10% of individuals used a wheelchair but cognitively

disoriented. Sixty-seven percent of individuals did not use a wheelchair.

Figure 8: Wheelchair Use
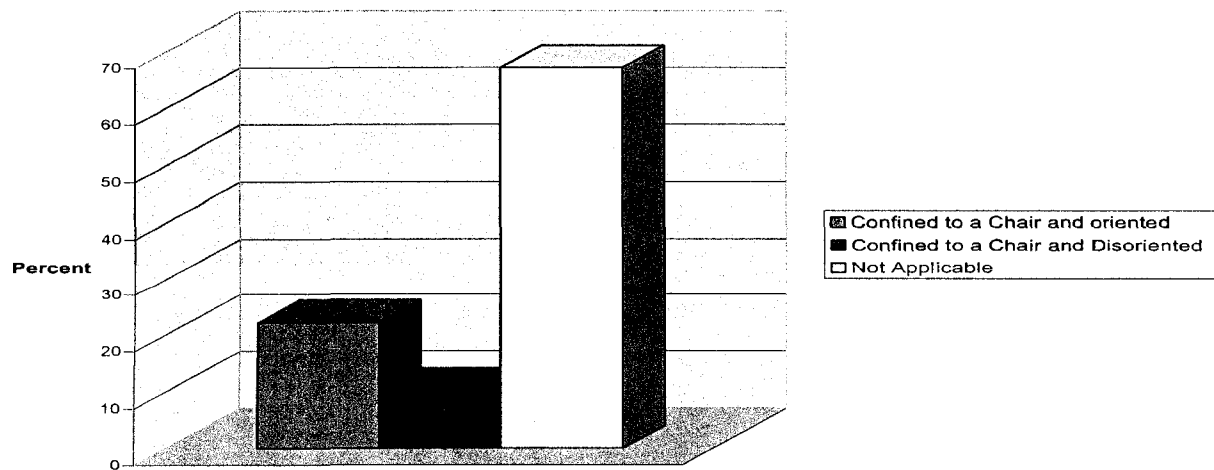
Fall Risk Assessment Questionnaire Responses

Our first step was to determine the results from the fall risk assessment document. The fall risk assessment is graded from 0 to 25. High risk of falling is classified as a score from 16-25, medium risk is classified as a score from 6-15, and low risk is anywhere between 0-5. The majority of residents who participated in this study were classified as medium risk. Twenty-nine residents were classified in the "high risk" category, forty residents were classified in the "medium risk" category, and eight residents were classified in the "low risk" category. The seniors classified at medium risk fall an average of 30.25 times per month.

Among those seniors who had the fall risk assessment analyzed the average age range of seniors was from 62 to 98 (n = 82). In the present study, a total of seventy-seven fall risk assessments scores were analyzed. The average risk score was 14.12± 6.13 with a 95% confidence interval of 12.82 to15.42. Eighty-four physical activity questionnaires were collected with a mean of 78.26± 6.35 with a 95% confidence interval of 76.86 to 79.66. In this study there were more female participants than male participants, 27% (n = 22) were male, and 73% (n = 62) were female.

Table 2 presents the descriptive statistics for the risk assessment scores by age and gender. Ninety-five percent confidence intervals were computed for risk assessment scores by males (Table 3), by females (Table 4) and by total (Table 5) for each of the estimated age groups.

Table 2: Average Risk Assessment Scores by Age and Gender

Variable Measured	Average RAS (± std) Total Sample	Average RAS (± std) Males	Average RAS (± std) Females
Age group 1 < = 80	mean = 15 std = 6.5 N= 14	mean = 19.71 std = 3.59 n_1= 7	mean = 10.2 std = 5.21 n_2= 7
Age group 2 > = 81 to < = 84	mean = 12.8 std = 5.62 N= 15	mean =20 std =3 n_1= 3	mean = 11 std = 4.57 n_2 = 12
Age group 3 > = 85 to < = 88	mean = 14.4 std = 6.74 N= 19	mean =20.6 std =4.72 n_1= 5	mean = 12.2 std = 6.01 n_2= 14
Age group 4 > = 89 to < = 90	mean = 15.6 std = 7.15 N= 13	mean = 19.8 std =3.11 n_1= 5	mean = 13.1 std = 7.9 n_2= 8
Age group 5 > = 91	mean = 12.8 std = 4.87 N= 15	mean =20 std =0 n_1= 2	mean = 11.6 std = 4.2 n_2= 13

Table 3: Confidence Intervals for Risk Assessment Scores by Males

Variable Measured	Mean	SD	SE	Upper Limit	Lower Limit
Age Group 1 < = 80	19.71	3.59	1.35	22.35	17.07
Age Group 2 > = 81 to < = 84	20	3	1.73	23.39	16.61
Age Group 3 > = 85 to < = 88	20.6	4.72	2.11	24.73	16.47
Age Group 4 > = 89 to < = 90	19.8	3.11	1.39	22.52	17.08
Age Group 5 > = 91	20	0	0	20	20

Table 4: Confidence Intervals for Risk Assessment Scores by Females

Variable Measured	Mean	SD	SE	Upper Limit	Lower Limit
Age Group 1 < = 80	10.28	5.21	1.97	14.14	6.42
Age Group 2 > = 81 to < = 84	11	4.57	1.32	13.58	8.42
Age Group 3 > = 85 to < = 88	12.21	6.01	1.60	15.34	9.08
Age Group 4 > = 89 to < = 90	13.1	7.91	2.79	18.4	7.7
Age Group 5 > = 91	11.6	4.21	1.16	13.87	9.33

Table 5: Confidence Intervals for Risk Assessment Scores by Total

Variable Measured	Mean	SD	SE	Upper Limit	Lower Limit
Age Group 1 < = 80	15	6.51	1.74	18.41	11.59
Age Group 2 > = 81 to < = 84	12.8	5.62	1.45	15.64	9.96
Age Group 3 > = 85 to < = 88	14.42	6.74	1.54	17.43	11.41
Age Group 4 > = 89 to < = 90	15.69	7.15	1.98	19.57	11.81
Age Group 5 > = 91	12.80	4.87	1.25	15.25	10.35

Retrospective Physical Activity Assessment Questionnaire Responses

Our next step was to determine the senior's level of activity. In attempt to determine the physical activity involvement of seniors on the cohort study here we created a physical activity involvement score by summing the responses to 29 selected questions which identify physical activity involvement at younger ages. A person was considered less active if they scored 29, while a person was considered extremely active if they scored 116. The distribution of physical activity involvement was as follows (low active: < 72; low-moderate active: 72-75; medium active: 76-79; high-moderate active: 80-83; and high active: > 84).

The data from the physical activity questionnaires were organized into five age groups. The lowest age among the seniors was sixty-two and the highest age was reported at ninety-eight years. Age groups were: group 1: < = 80; group 2: > = 81 to < = 84; group 3: > = 85 to < = 88 group 4: > = 89 to < = 90; group 5: > = 91.

Table 6 presents the results for the guardian reported retrospective physical activity involvement questionnaire as they pertain to each participant. Ninety-five percent confidence intervals were computed for the physical activity scores by males (Table 7) by females (Table 8) and by total (Table 9) for each of the estimated age groups.

Table 6: Average Physical Activity Scores by Age and Gender

Variable Measured	Average PAS (± std) Total Sample	Average PAS (± std) Males	Average PAS (± std) Females
Age group 1 **< = 80**	mean = 77.9 std = 6.56 N= 14	mean = 78 std = 6.13 n_1= 7	mean = 77.8 std =7.47 n_2= 7
Age group 2 **> = 81 to < = 84**	mean = 78.1 std = 7.4 N= 16	mean =85 std =8 n_1= 3	mean =76.6 std = 6.64 n_2= 13
Age group 3 **> = 85 to < = 88**	mean = 79 std = 4.54 N= 19	mean =79.2 std = 6.37 n_1= 5	mean = 78.9 std =4.0 n_2= 14
Age group 4 **> = 89 to < = 90**	mean = 79.1 std = 6.77 N= 17	mean = 84 std =6.89 n_1= 5	mean = 77 std = 5.8 n_2= 12
Age group 5 **> = 91**	mean = 77.2 std = 7.0 N= 17	mean = 78.5 std = 0.7 n_1= 2	mean = 77 std = 7.4 n_2= 15

Table 7: Confidence Intervals for Physical Activity Scores by Males

Variable Measured	Mean	SD	SE	Upper Limit	Lower Limit
Age Group 1 < = 80	78	6.13	2.31	82.52	73.48
Age Group 2 > = 81 to < = 84	85	8	4.61	94.03	75.97
Age Group 3 > = 85 to < = 88	79.2	6.37	2.85	84.78	73.62
Age Group 4 > = 89 to < = 90	84	6.89	3.08	90.03	77.97
Age Group 5 > = 91	78.5	0.70	0.5	79.48	77.52

Table 8: Confidence Intervals for Physical Activity Scores by Females

Variable Measured	Mean	SD	SE	Upper Limit	Lower Limit
Age Group 1 < = 80	77.8	7.47	2.82	83.32	72.28
Age Group 2 > = 81 to < = 84	76.6	6.64	1.84	80.2	73
Age Group 3 > = 85 to < = 88	78.9	4	1.07	80.99	76.81
Age Group 4 > = 89 to < = 90	77	5.83	1.68	80.29	73.71
Age Group 5 > = 91	77	7.46	1.92	80.76	73.24

Table 9: Confidence Intervals for Physical Activity Scores by Total

Variable Measured	Mean	SD	SE	Upper Limit	Lower Limit
Age Group 1 < = 80	77.9	6.56	1.75	81.33	74.47
Age Group 2 > = 81 to < = 84	78.1	7.43	1.85	81.72	74.48
Age Group 3 > = 85 to < = 88	79.0	4.54	1.04	81.03	76.97
Age Group 4 > = 89 to < = 90	79.1	6.77	1.64	82.31	75.89
Age Group 5 > = 91	77.2	7.00	1.69	80.51	73.89

Pearson product moment correlation coefficient scores were computed using SAS to determine the relationship between the physical activity scores and fall risk assessment scores. The results indicated that there was no correlation between the two scores, in either the total group or the separate sub-groups created for age (Table 10).

Further, a t-test was computed to evaluate the difference in the risk assessment by gender, the results indicate that there was a significant difference $t = 8.16$, df $= 63$ ($p < 0.05$) between males verses females risk assessment scores. Likewise, a t-test was computed to determine the difference in the risk assessment scores for individuals with high physical activity scores i.e.: scores (above 77) verses a low physical activity scores (less the 77). The results indicate that there was no significant difference $t = 1.97$ df $= 36$ ($p > 0.05$) on the risk activity scores in this comparison. Finally, an analysis of variance was used to compare the differences and the interaction between males and females, high verse low physically active individuals and the interactions between these variables on risk assessment scores. The results of this analysis

showed that no significance difference existed in the risk assessment scores between the males versus females, the high physical activity group and the low physical activity group, or the interaction term for the two groups combined.

Table 10: Pearson Product Moment Correlation Coefficient Results for Physical Activity Scores with Risk Assessment Scores for Age Groups and Total Group

Age Groups/Total	Physical Activity Scores with the Risk Assessment Scores
Age Group 1 **< = 80**	$r = 0.45$ $p = 0.10$ $n = 14$
Age Group 2 **> = 81 to < = 84**	$r = 0.11$ $p = 0.68$ $n = 15$
Age Group 3 **> = 85 to < = 88**	$r = 0.00$ $p = 0.98$ $n = 19$
Age Group 4 **> = 89 to < = 90**	$r = 0.36$ $p = 0.22$ $n = 13$
Age Group 5 **> = 91**	$r = 0.01$ $p = 0.95$ $n = 15$
Total	$r = 0.20$ $p = 0.08$ $n = 76$

Discussion

The present study was an epidemiological surveillance of retrospective physical activity and fall patterns over one year at Specialty Care Mississauga Road, long term care facility, in Mississauga, Ontario. The primary direction of this research was to provide an explanation as to whether physical activity at a younger age had a positive relation to fall patterns over the age of sixty-five years. The study was designed so that the researcher could collect data from a long term care facility that was accessible and through a physical activity questionnaire designed by the researcher. The information from the two data sets (i.e. retrospective physical activity profile and the fall risk assessment) were merged together to evaluate the research question using correlation procedures. This was the first retrospective cohort study on physical activity and fall patterns at Specialty Care Mississauga Road.

It was expected that through the process of data collection the Director of Care, Associate Director of Care, Registered Nurses and other medical staff could gain an understanding of the association between the past physical activity profile of the residents and the current incidence of falls. Likewise, the researcher intended to provide information to family members and/or community members that could essentially help in building knowledge and understanding as to why a resident may have a high risk of falling in relation to their past lifestyle. Furthermore, in this study the medical fall risk assessment was reviewed to provide a better understanding of the instrument's contribution to our understanding of the risk factors for falls. Readers and community members might also learn about information regarding physical activity and how it relates to the risk of falling at an older age.

The high number of falls at Specialty Care Mississauga Road exemplifies an apparent concern. Seniors who reside in long term care facilities may have multiple health risks, including

the risk of falling in and around a facility (Schoenfelder & Rubenstein, 2004). Time of year of falling is reasonably important however in a long term care facility the time of day is much more imperative. In long term care facilities the majority of falls occur during three specific time's, mid-afternoon at "change of shift", just after rising in the morning, and just before bedtime in the evening (Improving Senior Care, 2006). Many seniors who experience a fall related injury suffer from fall related fractures, soft tissue injuries and immobility that may lead to long-term disability or even death (Schoenfelder & Rubenstein, 2004). At the beginning of the study, a fall risk assessment was analyzed to determine the risk factor characteristics of each resident. The results of the study indicate a higher fall risk assessment score among the female participants when compared to male participants. This suggests that female participants (in this study) are at higher risk of falling when compared to the male participants. The results of the fall risk assessment also showed that 17% of residents were reported to have multiple falls, 61% of individuals were using anti-hypertensive medication that may cause loss of balance, 18% of residents experienced poor memory and recall ability, 5% of residents had severely impaired vision patterns, 23% percent of residents experienced total incontinence, 14% of residents had agitated behaviour, and 22% of the individuals in this cohort were in a wheelchair and cognitively oriented. Each characteristic is classified as a high risk factor and can lead to an increased chance of falling particularly for those aged seventy or older. Some of the percentages listed above are low, however current research tells us that having a combination of these characteristics (which resembles most residents) can be a major risk factor for falling. The amount of medication taken by a person influences the risk of falling (Improving Senior Care, 2006). The combination of four or more medications and/or use of psychotropic medication enhance fall risk (Improving Senior Care, 2006). Results from the fall risk assessment show that

residents at Specialty Care Mississauga Road use a combination of diverse medications. Sixty-one percent of residents were reported to be taking anti-hypertensive medication. Possible side effects of anti-hypertensive medication may include dizziness and lightheadedness, fainting, headache, increased sensitivity to light, weakness and fatigue, abdominal discomfort and nausea, edema and swelling in the legs, depression and constipation which may cause loss of balance or a fall (Improving Senior Care, 2006).

The analysis of the fall risk assessment shows an average of 30.25 of falls per month, with the highest number of falls in the month of January. There could be numerous reasons as to why January had the highest number of falls. Although not tested empirically, there is a good reason to suspect that the weather conditions in January were a contributing factor to increased incidence of falls. With the cold winter climate, exercise may not be as common, which may lead to less stability through detraining, as well as a reduction in movement and reaction time, resulting in an increased number of falls. Conversely, the decreased incidence of falls reported for the residents during the month of June may be attributed to the improved weather conditions.

The physical activity questionnaire examined the level of retrospective physical activity, periods of involvement in sport, and specific lifestyle behaviours for each resident who participated in the study. The data from the physical activity questionnaire were organized into age groups to ensure a balanced distribution of individuals according to the participant's current age. It was also easier to use the subgroup data when using SAS computations. Those residents who scored low on the questionnaire were classified as less active and those with a high score were classified as highly active. The statistically analyzed data showed that the majority of residents had a low scoring, thus classifying them as less active in their leisure time during their younger years. Before the initial analysis, it was hypothesized that those with a high score on the

physical activity questionnaire would have a low scoring on the fall risk assessment and conversely those individuals with a low score on the physical activity questionnaire would have a high scoring on the fall risk assessment index. However, the results of this study indicated that there was no correlation between the physical activity scores and the fall risk assessment scores either for the total group or for the separate sub-groups organized according to the respondent's current age.

Yet, this finding has strong limitations which should be identified when attempting to generalize to other cohorts of seniors, and especially to seniors in nursing homes. Although the research did not find any significant relationship, Health Canada, the Canadian Fitness and Lifestyle Research Institute, and several other research studies encourage moderate physical activity to increase optimal health and well-being among all ages, and to ensure an enhanced quality of life as we age. The lack of a significant finding in this study does not contradict the previous research but merely suggests that the expected relationship was not found in this study. This may be because there is a lack of activity being reported by the participants.

The research completed in this study resembles a variety of previous studies. The study of fall incidence among the elderly population and physical activity are two widely researched topics. Other previous studies have examined factors such as retrospective physical activity and lifestyle behaviours and the relationship between physical activity and fall patterns at an older age. Furthermore, the research in this study examined a fall risk assessment and compared the data to a physical activity questionnaire, a comparison that is not as common in current research, but one that may be expected given that there is an expected implicit link between these concepts – physical activity and falls. The research studies that have examined the association between current physical activity and fall patterns conclude that physical activity was shown to reduce

many risk factors for falling, especially those such as osteoporosis, non-insulin dependent diabetes, colon cancer, hypertension, and obesity; and have a beneficial effect on reducing anxiety and depression (Lim et al., 2005). It has been reported that physical activity may reduce the risk of fractures due to falling by preventing and reducing bone loss at all ages, increasing muscular strength, and improving balance, flexibility, coordination, and reaction time (Stevens et al., 1997). Moreover, strength training can help reduce many signs and symptoms of various debilitating chronic diseases such as osteoarthritis and osteoporosis (Centre for Disease Control and Prevention, 2007). In a recent article written by Gauchard et al. (2003) it was reported that physical activity in mid-age (forty-five to sixty-five) improves gaze and posture control on every level. It was also noted that physical activity at a younger age (under sixty-five years) may help speed recovery time from a fall related injury. The role of physical activity seems to be beneficial in the elderly, particularly in increasing postural control and balance, thus reducing falls (Gauchard et al., 2003). Research reports that physical inactivity may lead to premature death, chronic disease and disability (Health Canada, 2007). Health Canada encourage people of all ages to integrate physical activity into their daily routine, ultimately to reduce stress levels, strengthen their heart and lung functions, increase energy levels and to maintain healthy body structure (Health Canada, 2007). For seniors, it is recommended by Health Canada to accumulate thirty to sixty minutes of moderate physical activity for most days including endurance, flexibility, and strength and balance training (Health Canada, 2007). Specialty Care Mississauga Road schedules daily recreation therapy programs (organized through the recreation department) which include mild to moderate exercise activity. A number of these daily programs consist of gardening, dancing, walking, arts and crafts, baking and bowling. It is imperative that the staff at Specialty Care Mississauga Road adopt necessary initiatives to reduce the number of falls at the

facility, and is already doing so by incorporating such activities into the general program delivery.

Recommendations

Specialty Care Mississauga Road opened its doors in early 2005 and since that time there has been no extensive research completed on fall patterns. The following is recommended:

1. The fall risk assessment included a number of medications but did not include anti-depressants or anti-diabetics which may have an adverse affect on normal movement and cognitive behaviour (Improving Senior Care, 2006). It is suggested that further research be conducted at Specialty Care Mississauga Road examining all resident medication. This may help identify possible combinations of medication that are classified as high risk.

2. It is also recommended that the registered nurse team at Specialty Care Mississauga Road use the lowest effective dosage of medication as possible, decrease chronic usage of medications, withdraw those medications that are not absolutely necessary and conduct regular reviews on all resident medication (Public Health Agency of Canada, 2005).

3. Resident dietary intake was not monitored during the present study. It is reasonable to assume that one might be at greater risk of falling if not nourished properly (Health Canada, 2007). Future research is suggested to examine this possible risk factor at Specialty Care Mississauga Road as well as population wide.

4. Often the elderly will not take an eye examination due to high expenses; this may lead to numerous health concerns (Public Health Agency of Canada, 2005). To support prospective fall preventative research, it is recommended to examine visionary health, eye exams, and corrective techniques for the elderly.

5. The data also show that 89% of individuals had adequate vision patterns, that being able to see in adequate light with glasses on, however lots of seniors in long term care facilities do not wear their glasses, which may be a possible fall risk factor. There was no recorded data in this study that could support whether the seniors wore their glasses on a regular basis. It is recommended that the eye glasses be worn at all times to improve vision.

6. It would also be beneficial to examine the current exercise programs at Specialty Care Mississauga Road. Specialty Care Mississauga Road has a restorative care walking program, a full-time physiotherapist and part-time assistants who organize weekly physiotherapy programs. These programs were designed to help strengthen motor movements, gait, walking speed, ankle strength, posture control, and to also improve confidence. For future suggestion, it may be valuable to test the effectiveness of these current programs with examination tools and evaluation techniques that would test a resident's physical strength before and after a program to monitor improvements. Examining and monitoring those who are at high risk of falling and those who are at medium-low risk of falling.

7. Specialty Care Mississauga Road houses residents who have dementia. There is a greater risk for those with dementia and incidence of falls. As a limitation, this study did not identify those residents who have dementia and those residents who do not have dementia. It is recommended for future research to examine a population that includes seniors with dementia.

8. It is important to consider the concept of fear in falling in the elderly, as no research of this kind has been conducted at Specialty Care Mississauga Road. Fear of falling is widespread and is often considered to be the most common fear among the elderly (Public Health Agency of Canada, 2005). It has been reported that regular physical activity may help reduce

the fear of falling in older adults by increasing their confidence (Centre for Disease Control and Prevention, 2007). Recreation staff at Specialty Care Mississauga Road is encouraged to monitor participation in the activity programs and to consider tracking those residents who are not agreeable to participate; a qualitative study is suggested.

9. Many studies have shown that social determinants, whether it be one's income, education, housing and social support network have a strong relationship to one's health, level of disability and longevity of life (Public Health Agency of Canada, 2005). The present study did not evaluate the social economic status of the residents who reside at Specialty Care Mississauga Road. However, it is known that the majority residents are not governmentally funded for their living accommodations. It is recommended for future research to scrutinize the concept of social determinants to determine possible fall risk factors.

10. The disease of osteoporosis is an increasing health concern among the elderly population for both women and men (Osteoporosis Canada, 2007). The current study did not conclude as to whether the participants had Osteoporosis. For future recommendation, it will be valuable to follow those individuals at Specialty Care Mississauga Road who have Osteoporosis and take extra precautions to avoid risk factors in and around the facility.

11. The physical activity questionnaire used in this study is to be improved for future research. It is recommended that the questionnaire be altered to fit a range of questions that are more suitable for the senior population. For future reference, more detailed questions are required.

12. The fall risk assessment tool did not include "cause" as one of the variables. It is recommended that Specialty Care Mississauga Road staff incorporate this variable to better understand the fall patterns at the facility.

13. The seniors in this study sample may have a variety of cognitive health concerns, vision problems and may be over-medicated. Attention to these three risk factors may possibly help reduce falling behaviour significantly. It is recommended that Specialty Care Mississauga Road further observe these fall risk factors in detail. Furthermore, it is also suggested that an accurate fall history is record and thorough follow-up is completed by the nursing staff every time a senior falls.

To conclude, researching fall patterns in various aspects would lead to reduced mortality and morbidity and ultimately lower health care costs for the long term care facilities and for the Canadian Health Care System.

Conclusion

Falling can be an emotional, mental, and physiological burden on seniors and also on their registered nurses, doctors, family members and love ones, administrators and staff and continues to be a major health concern. Falls among the elderly are a growing health concern in Canada and the numbers of falls are increasing among seniors worldwide. In August 2007, the World Health Organization launched a Global Report on Falls Prevention in Older Age– a detailed report that includes recommendations for fall prevention in seniors both nationally and internationally (World health Organization, 2007). Falls and fall related fractures are one of the most researched topics. Developing effective guiding principles and programs in preventing falls begins with understanding the causes and factors influencing the increased propensity of seniors to fall. Mississauga, Ontario encompasses a widely diverse community that includes seniors who speak different languages and come from various cultural backgrounds and religious beliefs, thus, it is important to have a broad perspective when developing new policy and implementing new health programs (Public Health Agency of Canada, 2007). Various approaches will be required to meet the needs of seniors who are able-bodied and those who are chronically ill, as well for those who are living with their family members and those who are living in long term institutions. A successful approach in reducing falls among the elderly is determined by a strong, collective network of community members, health professionals, researchers and government officials.

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Appendix A: Introductory Letter

Dear _____ Family,

My name is Cindy Sabolic and I am currently completing the thesis requirements of a Master **of Public Health at Lakehead University.** My study of interest is in gerontology, physical activity and fall prevention. Currently, I am working on a research project entitled: **Does physical activity at a younger age reduce the likelihood of falls in seniors?**

As you may be aware, falls are a serious health problem among seniors. Fall prevention in long term care centers continues to be one of the most challenging aspects of care not only because of the high frequency of falls but also because of the effect on residents, families, staff and administration.

My goal, as the researcher, is to conduct a questionnaire on physical activity, evaluate the finding and conclude whether physical activity at a younger age reduces the likelihood of falling.

Enclosed is a questionnaire that I am asking you to complete as part of my research. The questionnaire will include questions related to your loved one's level of retrospective physical activity, periods of involvement in sport, and specific lifestyle behaviors. Your questionnaire responses will be compared to information in the Fall Risk Assessment that is completed on each resident at Specialty Care. **Please fill out the questionnaire to the best of your knowledge that best represents your loved one (living at Specialty Care) when they were between ages of fifty and sixty-five.**

It is expected that the questionnaire should take more then thirty minutes of your time. You may refuse any question you wish. It would be greatly appreciated to complete and return your questionnaire and consent form by **Wednesday January 31, 2006**. You will also notice an enclosed, self-addressed, and stamped envelop for you to return your completed questionnaire.

In addition, enclosed is a consent form for you to sign to ensure the information you provide will remain anonymous. Lakehead University will store the research data for a maximum of seven years in the Department of Professional School, but will remain anonymous.

Your answers will help me understand incidence of fall at Specialty Care that will promote better health for all residents. Your time and participation in this study will be greatly appreciated. If you have questions or want a copy of the results please contact me at home at **905-820-3818.**

Thank you for your time.

Sincerely,

Cindy Sabolic BA, G.DIP, MPH (Cand)   Thesis Supervisor: Dr. William Montelpare
Masters of Public Health   Professor, School of Kinesiology
Specialization in Health Studies   Lakehead University
1786 Paddock Crescent   955 Oliver Road
Mississauga, Ontario   Thunder Bay, Ontario
L5L 3E4   P7B 5E1

Appendix B: Participant Consent Form

I _____ have read the introductory letter regarding the research study: **Does physical activity at a younger age reduce the likelihood of falls in seniors?**

I am aware that dada will be stored at Lakehead University in the Masters of Public Health Department for a period of seven years.

I am aware that I am a volunteer for this study and I have a right to withdrawal from this study at an time without any conscience to me. All information that I provide will remain anonymous on the final report and I can request the results upon study completion.

I understand the information in the introductory letter, and I agree to participate in the study. I am aware the all of my information will be confidential and will only be viewed by the research student and the immediate supervisor Dr. Bill Montelpare.

_____

Signature of Participant   Date

Appendix C: Consent Form: Fall Risk Assessment Tool

Dear _____ Family,

As a researcher, I will be analyzing the *Fall Risk Assessment Tool* from the *Point Click Care* database at Specialty Care as part of my thesis. I will use the *Fall Risk Assessment Tool* to collect information about falls on each resident and will compare it to the physical activity questionnaire. Accessing this tool will help me understand incidence of falls at Specialty Care Mississauga Road.

The data that I subscribe from the *Fall Risk Assessment Tool* and physical activity questionnaire will be entered into a standard data for subsequent statistical analysis.

The data from the *Fall Risk Assessment Tool* will be collected at Specialty Care Mississauga Road and will be kept confidential.

I, Cindy Sabolic, ask for consent to access your loved one's *Falls Risk Assessment Tool* at Specialty Care Mississauga Road. Please sign below.

Sincerely,

Cindy Sabolic BA, G.DIP, MPH (Cand)
Masters of Public Health
Lakehead University

I _____ allow Cindy Sabolic to access the *Point Click Care* database to collect information from the *Fall Risk Assessment Tool*. Cindy is allowed to access the database to obtain fall risk information on my loved one living at Specialty Care Mississauga Road.

I am aware that all of the information will be confidential and will only be viewed by the research student (Cindy Sabolic) and the immediate supervisor Dr. Bill Montelpare.

Signature of Participant   Date

Appendix D: Physical Activity Questionnaire

Physical Activity Questionnaire

The questions below correspond to your loved one's activity involvement when they were between the ages of fifty and sixty-five. Please fill out the questionnaire to the best of your ability. The questionnaire should not take more than <u>thirty minutes</u> of your time. You may refuse any question you wish. **

INSTRUCTIONS
If he or she DID the activity between the ages of fifty and sixty five:

Step #1 Check the YES box.
Step #2 Circle how frequently they did the activity in a week.

Here is an example of how Mrs. Jones would answer question #1:
Mrs. Jones mother regularly visited her friends Maria and Christina before she moved into the long term care facility.

When your relative was between the ages of fifty and sixty years, did he or she....
1. Visit with friends or family (other than those you live with)?

☒ **YES** ➔ To the best of your
knowledge please circle how Never Sometimes Often Always
frequently in a week: (0) (1-2) (3-4) (5-6)

☐ **NO**

If he or she DID NOT do the activity:
Check the NO box and move to the next question.

---

1. Is your loved one male or female? ☐ Male ☐ Female

2. What is your loved one's current age? _____

When your relative was between the ages of fifty and sixty-five, did she or he....

3. Visit with friends or family (other than those you live with)?

☐ **YES** ➔ To the best of your
knowledge please circle Never Sometimes Often Always
how frequently in a week: (0) (1-2) (3-4) (5-6)

☐ **NO**

4. Do volunteer work?

☐ **YES** ➔ To the best of your
knowledge please circle Never Sometimes Often Always
how frequently in a week: (0) (1-2) (3-4) (5-6)

☐ **NO**

5. Attend religious services or take part in service activities?

☐ **YES** →   To the best of your
              knowledge please circle   Never   Sometimes   Often   Always
              how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ **NO**

6. Attend a community club or group meeting?

☐ **YES** →   To the best of your
              knowledge please circle   Never   Sometimes   Often   Always
              how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ **NO**

7. Play Golf?

☐ **YES** →   To the best of your
              knowledge please circle   Never   Sometimes   Often   Always
              how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ **NO**

8. Use a computer?

☐ **YES** →   To the best of your
              knowledge please circle   Never   Sometimes   Often   Always
              how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ NO

9. Dance (such as square, folk, line) (do not count aerobic dance)?

☐ **YES** →   To the best of your
              knowledge please circle   Never   Sometimes   Often   Always
              how frequently in a week: (0)   (1-2)   3-4)   (5-6)
☐ **NO**

10. Do woodworking, needlework, drawing, or other arts or crafts?

☐ **YES** →   To the best of your
              knowledge please circle   Never   Sometimes   Often   Always
              how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ **NO**

11. Attend a concert, movie, lecture, or sport event?

☐ **YES** ⟶
☐ **NO**

To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

12. Play cards, bingo, or board games with other people?

☐ **YES** ⟶
☐ **NO**

To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

13. Play Tennis?

☐ **YES** ⟶
☐ **NO**

To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

14. Play pool or billiards?

☐ **YES** ⟶
☐ **NO**

To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

15. Skate (ice, roller, or in-line)?

☐ **YES** ⟶
☐ **NO**

To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

16. Play a musical instrument?

☐ **YES** ⟶
☐ **NO**

To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

17. Read?

☐ YES ⟶ To the best of your
           knowledge please circle   Never   Sometimes   Often   Always
           how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ NO

18. Do heavy work around the house (such as washing windows, cleaning gutters)?

☐ YES ⟶ To the best of your
           knowledge please circle   Never   Sometimes   Often   Always
           how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ NO

19. Do light work around the house (such as sweeping or vacuuming)?

☐ YES ⟶ To the best of your
           knowledge please circle   Never   Sometimes   Often   Always
           how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ NO

20. Do heavy gardening (such as spading, raking)?

☐ YES ⟶ To the best of your
           knowledge please circle   Never   Sometimes   Often   Always
           how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ NO

21. Do light gardening (such as watering plants)?

☐ YES ⟶ To the best of your
           knowledge please circle   Never   Sometimes   Often   Always
           how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ NO

22. Work on their car, truck, lawn mower, or other machinery?

☐ YES ⟶ To the best of your
           knowledge please circle   Never   Sometimes   Often   Always
           how frequently in a week: (0)   (1-2)   (3-4)   (5-6)
☐ NO

23. Have a day time job?

☐ YES ⟶	To the best of your				
	knowledge please circle	Never	Sometimes	Often	Always
☐ NO	how frequently in a week:	(0)	(1-2)	(3-4)	(5-6)

Please note: If you have answered NO to the above question, please skip to question # 26

24. Sit while at work?

☐ YES ⟶	To the best of your				
	knowledge please circle	Never	Sometimes	Often	Always
☐ NO	how frequently in a week:	(0)	(1-2)	(3-4)	(5-6)

25. Stand while at work?

☐ YES ⟶	To the best of your				
	knowledge please circle	Never	Sometimes	Often	Always
☐ NO	how frequently in a week:	(0)	(1-2)	(3-4)	(5-6)

26. Walk while at work?

☐ YES ⟶	To the best of your				
	knowledge please circle	Never	Sometimes	Often	Always
☐ NO	how frequently in a week:	(0)	(1-2)	(3-4)	(5-6)

27. Lift heavy loads while at work?

☐ YES ⟶	To the best of your				
	knowledge please circle	Never	Sometimes	Often	Always
☐ NO	how frequently in a week:	(0)	(1-2)	(3-4)	(5-6)

** Please note: For the following questions about running and walking, include use of a treadmill**

28. Jog or run?

☐ YES ⟶	To the best of your				
	knowledge please circle	Never	Sometimes	Often	Always
☐ NO	how frequently in a week:	(0)	(1-2)	(3-4)	(5-6)

Walk uphill or hike uphill?

☐ **YES** ──▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

29. Walk <u>fast or briskly</u> for exercise?

☐ **YES** ──▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

30. Walk to do errands (such as to/from a store or take grandchildren to school)?

☐ **YES** ──▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

31. Walk leisurely for exercise or pleasure?

☐ **YES** ──▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

32. Ride a bicycle or stationary cycle?

☐ **YES** ──▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

33. Do other aerobic machines such as rowing, or step machines (do <u>not</u> count treadmill or stationary cycle)?

☐ **YES** ──▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

34. Do water exercises (do not count swimming)?

☐ **YES** ➝ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

35. Swimming moderate or fast?

☐ **YES** ➝ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

36. Swim gently?

☐ **YES** ➝ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

37. Do stretching or flexibility exercises (do <u>not</u> count yoga or Tai-chi)?

☐ **YES** ➝ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

38. Do yoga or tai-chi?

☐ **YES** ➝ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

39. Do aerobics or aerobic dancing?

☐ **YES** ➝ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

40. Do moderate to heavy strength training (such as hand held weight and push-ups)?

☐ **YES** ——▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

41. Do light strength training (such as hand-held weights)?

☐ **YES** ——▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

42. Do general conditions exercise, such as light calisthenics or chair exercises (do not count strength training)?

☐ **YES** ——▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

43. Play basketball, soccer or racquetball?

☐ **YES** ——▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

☐ **NO**

44. Do other types of physical activity not previously mentioned (please specify)?

☐ **YES** ——▶ To the best of your
knowledge please circle   Never   Sometimes   Often   Always
how frequently in a week: (0)   (1-2)   (3-4)   (5-6)

If YES, Please Specify:

_____

_____

☐ **NO**

If you wish to review the study results please contact me at ccsaboli@lakeheadu.ca *anytime.*

It would be greatly appreciated to complete and return your questionnaire and consent form by
Wednesday January 31, 2006.

THANK YOU FOR COMPLETING THE QUESTIONNAIRE