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Health, fitness, and life satisfaction in retired teachers

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Health, Fitness, and Life Satisfaction in Retired Teachers

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Abstract

The purpose of this study was to describe the health, fitness, and life satisfaction of retired teachers in Thunder Bay. Forty retired teachers (24 women, 16 men) aged 55 to 70 years participated in the study. Fitness level, physical activity participation, and lifestyle habits were measured according to the protocol of The Canadian Physical Activity, Fitness, and Lifestyle Appraisal (CPAFLA), and compared to *Estimated Health Benefit Zones*. Fitness level was also compared to norms from the 1981 Canada Fitness Survey (CFS). Over 50% of the sample scored Good or higher on all fitness measures, and on measures of physical activity participation and lifestyle habits, over 90% scored in this range. Comparisons to the CFS revealed average fitness levels, not markedly different from the general Canadian population. Levels of high density lipoproteins (HDL), low density lipoproteins (LDL), and triglycerides, as well as the ratio of total cholesterol to HDL were in a range designated as healthy or desirable for at least 50% of the sample. Self-report measures indicated a high level of satisfaction with retirement life, and extremely healthy lifestyle behaviours. Both perceived health and life satisfaction were significantly correlated with aerobic fitness, indicating possible benefits of maintaining a physically active lifestyle during retirement. Retired teachers were found to be in good physical health, possess exceptionally healthy behaviours with respect to lifestyle and physical activity participation, and be extremely satisfied with retirement life.

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Introduction

Canada's population is growing older (Levy, 1982), and individuals over the age of 65 comprise the fastest growing segment of the North American population (Brown, 1992; Howard, Marshall, Rechnitzer, Cunningham, & Donner, 1982; Jackson, 1988; Mihalko & McAuley, 1996). According to the 1979 Canada Senate report on retirement policies, by the year 2031, Canadians aged 65 and older will number between 6 and 8 million, approximately 20% of the Canadian population (Brown, 1992; Howard et al., 1982; Jackson, 1988; Spirduso, 1986). The number of elderly Canadians continues to increase and is presently approaching the 3.4 million expected in 2001 (Howard et al., 1982; Levy, 1982). Researchers assert that the retired and elderly are increasingly seen as important candidates for health promotion (Morgan, Dallosso, Bassey, Ebrahim, Fentem, & Arie, 1991).

Aging and Physical Activity

By their very nature, physical activity and exercise have more impact on age-related changes in mental and physical health and longevity than any other single variable (Deobil, 1989; McAuley, Lox, & Duncan, 1993; McAuley & Rudolph, 1995; Shephard, 1982; Spirduso, 1994). The 1988 Campbell's Survey on Well-Being in Canada revealed an association between greater levels of activity and better self-rated health status (Stephens & Craig, 1990). Despite the potential benefits, however, Fitness and Lifestyle in Canada (1983) revealed that only half of the population of older Canadians was regularly active (Fitness Canada, 1983). More recently, McAuley and Rudolph (1995) reported that while the percentage had increased, still only 60% of those aged 65 and older involved

themselves in any leisure-time physical activity; a staggering 40% remain sedentary. Nieman and Haddock (1995) present an even bleaker assessment of the situation adding that according to National Surveys, only about one-third of the elderly exercise regularly; this they claim is less than any other age group. In spite of low participation rates, and because of the obvious benefits, physical activity and fitness remain the priority area in general health promotion and maintenance (McAuley & Rudolph, 1995). Among the many benefits of physical activity is the maintenance of one's functional capabilities. Functional independence of an aging population is fundamental and critical to length of life, and more importantly to quality of life (Berger & Hecht, 1989; Morgan et al., 1991; Nieman & Haddock, 1995; Shephard, 1982; Spirduso, 1994; Stones, Kozma, & Stones, 1985). While it is known that decreases in regular physical activity associated with aging are a major cause of declining cardiorespiratory capacity, there is some disagreement over reasons for the decline in functional capacity observed in aging individuals. McCulloch, Clark, Pike, and Slobodian (1994) suggest that while this diminishing of capabilities is often ascribed to `biological aging', other factors may play a role, namely physical inactivity in the retirement years.

Retirement

The rapid growth of the older adult population has been accompanied by a dramatic downward trend in the retirement age (Bossé, Aldwin, Levenson, & Ekerdt, 1987; Brown, 1992; Clarke & Marshall, 1996; Peppers, 1976). Age 65 has been the traditional retirement age for most people in the work force, however, the 90s present a much different circumstance. Increasing numbers of workers are retiring between the ages of

50 and 55 and, as a result, more individuals will spend a greater portion of their lifetime in retirement (Russell, 1987). Consequently, society is faced with a group of individuals who once had a lack of leisure time and are now confronted with a surplus of available time (Clarke & Marshall, 1996; Jackson, 1988).

Retirement and Physical Activity

The activity patterns of Canadian women and men in retirement differ considerably from activity habits adhered to in earlier years (Cunningham, Rechnitzer, Howard, & Donner, 1987; Lindsay & Deveraux, 1991, cited in McCulloch et al., 1994; Wong, Rechnitzer, Cunningham, & Howard, 1990). With advancing age, decreases in the amount of leisure activity, particularly physical activity, have been documented rather consistently (Cunningham et al., 1987; McCulloch et al., 1994). Kolanowski and Gunter (1988) suggest that while there has been an increased awareness of the relevance of exercise for the aged, this apparent decline in exercise participation is most often associated with retirement. This lower level of regular physical activity seen in retired individuals is one factor purported to contribute to the deterioration in physical condition (Cunningham et al., 1987; Floyd et al., 1992). Social norms support the notion that retirement is associated with the belief that one should slow down and `take it easy', and enjoy a well-earned rest. Researchers assert that for active individuals heeding this advice, the abrupt change in daily activity may affect overall fitness level (Kolanowski & Gunter, 1988; Wong et al., 1990).

Retirement Satisfaction

Retirement satisfaction is highly personalized, with experiences ranging from

fulfilling and satisfying (accompanied by new goals, interests, and activities), to stressful, frustrating, and depressing (often associated with rapid physical deterioration) (Bossé et al., 1987; Floyd et al., 1992; Odell, Soloninka, Lawrence, & Gartin, 1992). Floyd et al. (1992) stated that one-third of retirees have difficulty adjusting to retirement and, as a result of this transition, life satisfaction appears to decline. Many have asserted, however, that life satisfaction in retirement is related to several other life circumstances including health, leisure activity, education and occupational status, age, gender, mobility, marital status, length of retirement, and retirement income (Crowley, 1986; Dorfman & Moffett, 1987; Odell et al., 1992; Peppers et al., 1976; Riddick, 1985; Russell, 1987, Seccombe & Lee, 1986; Soumerai & Avorn, 1983). The event of retirement itself does not appear to affect the emotional well-being of retirees (Crowley, 1986; Seccombe & Lee, 1986).

Retirement and Teachers

Researchers speculate that pre-retirement occupation may affect one's perception of retirement (Atchley, 1985; Riddick, 1985; seccombe & Lee, 1986). Studies conducted between the 1960s and 1980s have revealed that adjustment in retirement varies directly with the status of the retirees' previous occupation (Chatfield, 1977; George, 1980, cited in Seccombe & Lee, 1986; George & Maddox, 1977; Larson, 1978; Loether, 1964; Riddick, 1985).

In many respects, teachers as an occupational group are different from other white-collar workers. According to Atchley (1985) retired teachers in the United States were found to be different than other professional groups and blue-collar workers with respect

to their adjustment to retirement and aging. In earlier work with female teachers in retirement, Cottrell and Atchley (1969) inferred that teachers generally enter retirement with high ratings of life satisfaction. In their work, they found depression in teachers to be uncommon and retirement adjustment to be relatively quick and smooth. For many teachers this adjustment was eased by remaining involved in pre-retirement work related roles, but in reduced capacities.

Significance of the Study

It is important to understand the uniqueness of the teaching profession in the aspects of retirement age, pension benefits, and working conditions such as number and length of teaching days. As a result of retirement benefits earned, Ontario teachers retire at an early age (on average 57.5) relative to other white-collar workers (personal communication, John Cappelletti, Ontario Teachers Pension Plan Board, 30 December, 1997). Teachers potentially spend more years in retirement, therefore, than most of their white-collar counterparts. Prior to 1973 teachers employed in the province of Ontario were not required to have a university degree. As a result, many began working in the teaching profession soon after high school graduation at ages as young as 19 or 20, following 6 weeks of teacher training during the summer months (personal communication, Don Cattani, president, OECTA Secondary Thunder Bay, 20 June, 1997). Having provided the required years of credited service to school boards and contributed extensively to the pension plan, teachers retiring in the 90s are doing so with quality retirement packages, and at significantly younger ages than those required in many other white-collar occupations. As a result, teachers are at liberty to pursue other interests unencumbered,

in many cases, by the demands of employment. This retirement circumstance may provide benefits to levels of health and fitness in teachers that perhaps would not be observed if retirement was offered at the traditional age of 65.

The length of a `working year' also differentiates teachers from those in many white-collar occupations. In a 10-month academic year, paid teaching days approximate 195, and unpaid vacation time plus statutory holidays approach 12 weeks. It must be realized that teachers are not at liberty to make decisions regarding the number of teaching days in any school year, as this is mandated by the provincial government. As in other professions, teachers dedicate time to their teaching responsibilities beyond that required in the classroom. Daily hours spent on site are slightly fewer than those required in most other white-collar jobs, however, the Ontario government equates a full day of teaching with an 8-hour work day. Teachers are expected to employ between 5 1/2 and 6 hours daily at their designated school in actual classroom teaching. The choice of additional and necessary planning and preparation time is left to the teacher, who, in effect, is learning and practising how to use available leisure time. This flexibility in the teaching schedule lends itself to the retirement transition.

Purpose of the Study

The combination of the singularity of retirement for teachers and the characteristic structure and routines of the profession make studying this group both interesting and of practical relevance. It is the purpose of this study to examine the physiological and self-report health of teachers who have retired from teaching in elementary and secondary schools in Thunder Bay, and to compare levels of health to both health benefit zones

(CSEP, 1996) and 1981 Canada Fitness Survey results. Health status will be assessed by an individual fitness appraisal, a measurement of serum lipids, and a series of questionnaires designed to assess physical activity behaviours, lifestyle habits, and life satisfaction.

Hypotheses

Related studies have consistently reported that occupational status does have an effect on health (Chatfield, 1977; Seccombe & Lee, 1986). The off-shoot of spending a significant proportion of life in a particular career may be manifested in one's physical health and well-being long after leaving the job. Active use of leisure time is positively related to education, income, and occupational status (Allison & Coburn, 1985; CSEP, 1996). The early retirement afforded to teachers, therefore, allows them the option of engaging in physical leisure activities more frequently. Consequently, it is expected that good physical and self-report health will be observed among retired teachers in this sample. Positive effects of retirement satisfaction have been observed in white-collar workers, and life satisfaction has been consistently high in samples of teachers (Atchley, 1985; Loether, 1964; Riddick, 1985). Therefore, it is also anticipated that high life satisfaction scores will be reported by this group of teachers. High life satisfaction has often been accompanied by positive physical and self-rated health in teachers and other white-collar workers (Dorfman & Moffett, 1987; McMurdo & Burnett, 1992). A positive association among all indices of physiological and self-report health is also hypothesized.

Review of Literature

Aging and Physical Activity

Aging naturally causes a one-third decline in aerobic capacity and inactivity unnaturally causes a two-thirds decline (Nieman & Haddock, 1995). According to many gerontologists, a key ingredient in healthy aging is regular physical activity (Gregg, Kriska, Fox, & Cauley, 1996; McCulloch et al., 1994; Nieman & Haddock, 1995; Shephard, 1982), and researchers have acknowledged the popularity of physical activity as a means of health maintenance (Blumenthal, Schocken, Needels, & Hindle, 1982; Morgan et al., 1991; Simons & Birkimer, 1988). The benefits of exercise on physiological function have been well-documented, and physical activity has been demonstrated to influence virtually all parameters of fitness (Berger, 1989; Blumenthal et al., 1982; McAuley et al., 1993; Mihalko & McAuley, 1996; Nieman & Haddock, 1995; Nieman, Warren, Dotson, Butterworth, & Henson, 1993; Rimmer, 1996; Shephard, 1982). Improvement in overall health and well-being, as well as the slowing or reversing of many age-related declines in physiologic functioning and performance, have been observed as a consequence of a more active lifestyle (Morgan et al., 1991; Shephard, 1982).

The maintenance of fitness is extremely important for the older adult. When one or more fitness parameters declines, a person's ability to perform activities of daily living such as lifting or climbing stairs, is also impaired (Deobil, 1989; Mihalko & McAuley, 1996; Rantanen, Era, Kauppinen, & Heikkinen, 1994; Rimmer, 1996). In a longitudinal study by Simonsick et al. (1993), men and women aged 65 and older were followed over a 6-year

period. Physical activity was found to be associated with a reduced risk of functional decline (cited in Gregg et al., 1996). Deobil (1989) argues that regular exercise may be the most effective intervention to postpone the natural deterioration in functional capacity occurring with age. Improvement in health can be observed not only through vigorous physical activity such as running and cycling, as was once thought, but also through a physical activity program performed at a moderate intensity (CSEP, 1996; Deobil, 1989; Motoyama et al., 1995).

Retirement and Physical Health

Although the literature fails to identify that retirement is likely to harm the physical health of older adults, the idea persists that retirement has adverse effects on health (Bossé et al., 1987; Ekerdt, 1987; Howard et al., 1982), and increases the risk of death (Ekerdt, 1987). However, since as early as 1950, authors of retirement studies have consistently reported that retirement is not responsible for either the decline in health status or the risk of death (Ekerdt, 1987; Soumerai & Avorn, 1983). Others are in support, arguing that in the past decade, reports in the literature have suggested little or no decline in physical health as a result of retirement (Bossé et al., 1987; Howard et al., 1982). Consequently, findings regarding the influence of retirement on physical health are fairly conclusive (Ekerdt, 1987).

Relative to fitness studies focusing on the aging population, little has been published about physical health status during retirement. Prior to 1987, the role of physical activity in bringing about changes in fitness level during the retirement years had not been studied (Cunningham et al., 1987). Among documented studies since this time,

several fitness components have been measured including aerobic capacity (VO_{2max}), muscular strength and endurance, flexibility, heart rate, blood pressure, and anthropometric measures including weight and percent body fat (Cunningham et al., 1987; McCulloch et al., 1994; Takeshima, Tanaka, Kobayashi, Watanabe, & Kato, 1993; Wong et al., 1990). Health indicators such as blood cholesterol and triglycerides have also been examined (Cunningham et al., 1987; Frey, Berg, Baumstark, Collatz, & Keul, 1990; Motoyama et al., 1995; Waller, Ward & Rudmann, 1992).

Aerobic Capacity

In studies assessing health in an older population, $V0_{2max}$ has been among the main fitness components measured (Cunningham et al., 1987; McCulloch et al., 1994; Takeshima et al., 1993; Wong et al., 1990). McCulloch et al. (1994) examined several fitness components and anthropometric parameters in a randomly selected sample of Saskatchewan rural and urban women (n=60) and men (n=40) aged 65 to 75 years. They assessed fitness levels and compared results to 65 to 69 year old gender-matched norms from the 1981 *Canada Fitness Survey (CFS)*. When predicted VO_{2max} was compared to gender-matched CFS norms for those aged 65 to 69, no single group of either women or men in their study (65-69 or 70-75) demonstrated recommended levels of aerobic fitness. All groups were significantly lower in $V0_{2max}$ than the 65 to 69 year old subjects. On post-test measures of heart rate and blood pressure, McCulloch et al. (1994) reported that both cardiovascular variables were unchanged in both age groups of Saskatchewan male retirees.

In a study of 200 retired men aged 55 to 65, Cunningham et al. (1987) also

measured maximal oxygen consumption levels. After 1 year of retirement, 100 control group subjects demonstrated no significant change in $V0_{2max}$, as evidenced by pre- and post-test values of 29.6 and 30.3 ml/kg/min respectively. Wong et al. (1990) also measured VO_{2max} in 69 men at the time of retirement and 1 year post-retirement. Similar to findings from Cunningham et al. (1987), subjects exhibited no change in VO_{2max} 1 year after retirement. Takeshima et al. (1993) determined $V0_{2max}$ levels in a group of sedentary but healthy elderly women and men (n=8, mean age=68.8). A mean $V0_{2max}$ value of 24.8 ml/kg/min was reported.

Muscular Strength and Flexibility

Low levels of grip strength were reported by male retirees studied by Cunningham et al. (1987). Control group retirees (aged 55-65) revealed a significant decrease in grip strength in both the left and right hands 1 year after retirement. This may perhaps be a result of lifestyle changes in retirement where physical tasks of a job associated with muscular strength are no longer part of a daily routine as they once were when individuals were employed. According to McCulloch et al. (1994), men in their study aged 65 to 69 and 70 to 75 were equal to the 65 to 69 year old CFS men on measures of grip strength. They also found that women aged 65-75 demonstrated little decline in measures of grip strength. One possible explanation may be that grip strength is not an occupational requirement for women as it often is with men, and so would not be subject to significant declines or changes during retirement (McCulloch et al., 1994).

In assessing levels of hip flexibility, the sit and reach test has been employed predominantly. Moderate levels of flexibility have been observed in studies of similarily

aged individuals. Cunningham et al. (1987) reported little change in flexibility in a group of men 1 year after retirement. McCulloch et al. (1994) reported similar findings. When compared to the CFS data for women aged 65 to 69, McCulloch et al. (1994) found that women in both age categories (65-69 and 70-75) demonstrated declines in flexibility which were small and insignificant.

Body Composition

Aging is normally associated with changes in body composition, particularly a gradual increase in the amount of body fat (CSEP, 1996; Leaf & Parker, 1990; Patrick, Bassey, & Fentem, 1982). In a study of men retired from manual work, Patrick et al. (1982) noted that body fat had increased 3% from the year prior to retirement, to 1 year following retirement. Similar results were observed 1 year after retirement in studies by both Cunningham et al. (1987) and Wong et al. (1990). They found that percent body fat measurements increased significantly in control group men aged 55 to 65. In contrast, however, subjects in the exercise group were able to maintain or decrease their weight and percent body fat. In the work by McCulloch et al. (1994) both women and men in the 65 to 69 age category demonstrated significantly higher sum of 5 skinfold measurements than the age- and gender-matched CFS subjects. Men in both age ranges (65-69 and 70-75) were also significantly higher on body mass index (BMI) and sum of 2 trunk skinfolds. The younger grouping of men (aged 65-69) was poorer in all anthropometric variables than was any other group in this study.

Blood Lipid Concentrations

Elevated levels of blood lipids have been implicated as a primary risk factor in the

development of coronary artery disease (CAD) (Johnson & Johnson Clinical Diagnostics, Inc., 1996; Leon, 1987; McArdle, Katch, & Katch, 1996; Pollock & Wilmore, 1990; Wilmore & Costill, 1994), and CAD is a leading cause of death and disability for the elderly (Leaf & Parker, 1990; Waller et al., 1992). It is widely accepted in the medical field and health literature, that measurements of total cholesterol levels without attention to the class of lipoproteins provide an incorrect indication of one's risk for CAD. The distribution of cholesterol among the various types of lipoproteins in the blood is a more powerful predictor of heart disease than is the total quantity of lipids, and consequently, the most accurate index of CAD risk is the ratio of total cholesterol to HDL (Leon, 1987 ; McArdle, Katch, & Katch, 1996; Pollock & Wilmore, 1990; Wilmore & Costill, 1994).

Measures of blood cholesterol and triglycerides in the healthy elderly have not been researched extensively (Waller et al., 1992). In one study of retirees, Cunningham et al. (1987) assigned retired male volunteers aged 55 to 65 to either an activity or control group. One year after retirement both groups revealed an increase in HDL cholesterol, and the control group demonstrated a significant increase in total cholesterol. These increases may suggest that the event of retirement itself was more influential than exercise in bringing about these changes (Cunningham et al., 1987). In a 9-month study of healthy elderly, Motoyama et al. (1995) measured serum lipids in 15 women and men, mean age 73.7, and found no differences on post-test measurements. However, at the onset of the study, values for total cholesterol and triglycerides were found to be in the `borderline risk' area (according to the National Cholesterol Education Program) with values of 5.3 and 4.0 mmol/L respectively, while LDL cholesterol levels were considered `desirable' (3.3). In a

similar study, Takeshima et al. (1993) measured serum cholesterol and triglyceride concentrations in a sample of healthy elderly women and men (n=8, mean age=68.8). They too, found total cholesterol (5.6) and triglyceride (2.9) levels in the `borderline risk' area, and LDL levels (3.4) to be healthy.

Retirement and Life Satisfaction

In addition to physiological benefits, habitual physical activity has been shown to extend longevity and enhance quality of life and life satisfaction (Bokovoy & Blair, 1994; Nieman et al., 1993). The ability to enjoy retirement and have a satisfying life can be considerably restricted by health problems and concerns (Seccombe & Lee, 1986). Therefore, in order to maximize the satisfaction of one's retirement years, good health is essential. For the past 3 decades, research on life satisfaction in retirement has attempted to understand the relationship between life satisfaction in retirement and variables of life circumstances. Among these variables age, income and education level, gender, housing, mobility, marital status, occupational prestige, leisure activity, and health status have been considered (Odell et al., 1992; Riddick, 1985; Russell, 1987). While cross-sectional studies of retirees have frequently revealed lower life satisfaction among retirees than in employed individuals of a similar age (Riddick, 1985), Seccombe and Lee (1986) identified that other variables, namely poor health, have often preceded retirement. Soumerai and Avorn (1983) added that in many cases poor health has promoted early retirement.

Health as a Measure of Retirement Satisfaction

Health and retirement are interrelated (Atchley, 1985; George & Maddox, 1977). Health is related to almost every dimension of adjustment in older persons (Seccombe &

Lee, 1986), and is one of the most influential constructs associated with positive life satisfaction in retirement (Dorfman & Moffett, 1987; Riddick, 1985; Russell, 1987). Higher satisfaction in retirement has been linked to good health (Howard et al., 1982), and the lower morale frequently reported among retirees has been greatly attributed to poorer health. Consequently, life satisfaction in retirement can be less than optimal for those in poor physical health (Seccombe & Lee, 1986).

Using two measures of satisfaction, Dorfman and Moffett (1987) found that self-perceived health was significantly related to life satisfaction of married and widowed retired women. The greater the perception of health status, the more positively the individual described her retirement. The Retirement Descriptive Index determined participants' affective responses to retirement, while the Life Satisfaction Index-Z provided a more general assessment of morale and well-being. In an earlier study by Dorfman et al. (1985), the subjective measure of self-perceived health was found to be a stronger predictor of life satisfaction than the more objective functional health (cited in Dorfman & Moffett, 1987).

In 1986, Seccombe and Lee studied gender differences in retirement satisfaction. Satisfaction was measured by responses from a 2-item scale: "Are you happy that you retired?" and "All things considered, are you more happy now or less happy now, than you were before you retired?" These researchers found that of the four predictor variables (self-rated health, income, marital status, and occupational status) self-rated health was the strongest correlate of retirement satisfaction for both women (r=.33) and men (r=.32). These four variables, however, accounted for only 13% of the variation in retirement satisfaction for each gender, suggesting that life satisfaction is influenced by several

factors.

By using the 18-item Life Satisfaction Index, Riddick (1985), too, reported that good health was positively related to life satisfaction. Riddick (1985) hypothesized that health problems had a direct negative effect on life satisfaction in retirement. In her study, a single-item self-rated health measure indicated that health problems were very much a meaningful predictor of life satisfaction among female retirees. This relationship was such that, as health problems worsened, life satisfaction decreased. Preceded by income and leisure activity participation, health problems were the third most meaningful predictor. These three variables combined, however, accounted for only 25% of the total variance, once again supporting the influence of other variables on life satisfaction.

Length of Retirement

While a substantial amount of retirement research has involved inquiry into alterations in lifestyle following retirement, few studies have considered length of retirement as a factor affecting the retirement experience. In a review of research conducted in the 1960s and 70s, Dorfman and Moffett (1987) found that length of retirement was positively associated with retirement satisfaction. More frequently, however, research has revealed few or no effects related to length of retirement (Bossé et al., 1987; Chatfield, 1977; Floyd et al., 1992). In the late 70s, Chatfield (1977) measured retirement satisfaction in older people. He found that satisfaction with retirement was the same for non-retirees as it was for individuals who had been retired for more than 1 year. Most dissatisfaction appeared to occur during the first year of retirement, possibly in support of the initial adjustment to retirement life. Bossé et al.

(1987) investigated psychological symptoms in a sample of 1,513 retired men. Using exploratory analyses to examine retirement circumstances, they reported no effects for length of retirement. In an effort to design a questionnaire for measuring retirement satisfaction, Floyd et al. (1992) studied a sample of 402 women and men regarding their retirement experience. Once again, few effects related to length of retirement were found. Recently, Odell et al. (1992) studied retired male teachers, and addressed the relationship between life satisfaction and length of retirement. Number of years in retirement was found to correlate moderately, albeit negatively, with life satisfaction. That is to say that teachers who had been retired longer, rated their satisfaction with life lower than more recent retirees.

Retirement and Occupational Status

Retirement satisfaction has been studied extensively, and research on physical health in retirement is ever-so-slowly gaining attention. Little has been published, however, on the association between these health indices and pre-retirement occupation. Researchers have suggested that skills developed in higher-status occupations prepare one differently for retirement than those developed in lower-status occupations. More specifically, many contend that characteristics of differing occupations prepare individuals differently for retirement, some better than others (George, 1980, cited in Seccombe & Lee, 1986; Loether, 1964).

Responses to Canada's Health Promotion Survey, 1990, revealed that active use of leisure time was more common as education, income and occupational status increased (Allison & Coburn, 1985; CSEP, 1996). The majority of research in Ontario and Canada

indicates that blue-collar workers participate in leisure exercise activities less than do white-collar workers (Allison & Coburn, 1985). Commentary by a cardiologist also supports the argument that occupational status has an effect on health and fitness levels. Dr. Weeks suggested that the high incidence of death due to coronary heart disease observed in Thunder Bay is a result of the large percentage of blue-collar workers residing in this city. Lower levels of education and high levels of stress, often associated with low job security, support this speculation (Weeks, The Chronicle Journal, January 14, 1997).

Because of the limited physical nature of much of their work, blue-collar workers need different physical activity and more of it (Allison & Coburn, 1985). Consequently, Allison and Coburn (1985) considered the issue of low levels of exercise among blue-collar workers, and reported that the primary explanation for the lack of exercise participation evidenced in blue-collar workers was the nature of the work activity. Blue-collar workers concede that their `work' physical activity is of a high enough intensity to replace `leisure' physical activity, and consequently, do not feel the need for extra leisure time exercise (Allison & Coburn, 1985). Allison and Coburn (1985) have pointed out that leisure physical activity, however, has a greater impact on fitness than does work physical activity, and that much of the blue-collar work considered `heavy' or physically demanding, does not affect an increase in cardiovascular fitness. In their study, (Allison & Coburn, 1985), workers also expressed being physically fatigued by the stress of the repetitive nature of their work, resulting in less leisure physical activity participation.

In a more recent study considering the variables of occupational status and self-rated health, Era, Lyyra, Viitasalo, and Heikkinen (1992) compared maximal isometric

muscle strength of five muscle groups in men of differing ages. Subjects were grouped according to age (31 to 35, 51 to 55, and 71 to 75) and were further subdivided by occupational status, being designated as either white-collar or manual workers. Significant differences between both age and occupational groups were observed. In all muscle groups tested, manual workers in the youngest age group exhibited higher strength values than the age-matched white-collar workers. Among the middle and older groups, however, manual workers were found to have the poorest strength performance of all the groups.

In addition to physical health, occupational status is also said to influence life satisfaction (Atchley, 1985; Odell et al., 1992; Riddick, 1985). Most researchers addressing the intervention of occupational status on retirement satisfaction have suggested that by their very nature, occupations expose workers to skills required in one particular field, and that these skills may or may not be transferrable (Chatfield, 1977, George & Maddox, 1977; Larson, 1978).

Riddick (1985) compared female retirees, homemakers, and workers, on levels of life satisfaction. Employment status was found to exert a significant influence, with workers revealing higher life satisfaction than either homemakers or retirees. In a 1986 study, Seccombe and Lee (1986) evaluated satisfaction with retirement in a sample of 1,530 retired residents of Washington State. Although they observed a positive effect of occupational status on retirement satisfaction, they found occupational status to be the weakest correlate of life satisfaction in retirement for both women and men. When health and income were controlled, however, this relationship was no longer evident.

In researching adjustment to early retirement of white- and blue-collar workers,

Heidbreder (1972) observed differences in the work-retirement transition between these classifications of workers. The majority of workers were satisfied with retirement. Blue-collar workers in poor health and with low levels of income and education, however, adapted to retirement changes with greater difficulty and less ease than the previously employed sample of white-collar workers (cited in Atchley, 1985). In his study of white-collar and blue-collar workers, Loether (1964) also reported that white-collar workers expressed greater job satisfaction than did blue-collar workers. Congruent with the findings by Heidbreder (1972), blue-collar workers were less likely to make a smooth transition from work to retirement. These differences may be largely explained by differences in socio-economic status and the consequent quality of life after retirement.

Retirement and Teachers

Retired teachers represent a homogeneous group on the dimension of occupational status. Odell et al. (1992) studied the life satisfaction of retired men, formerly secondary school teachers of agriculture, living in West Virginia. Life satisfaction of teachers in this sample was found to be high. In a programme aimed at promoting well-being and health of aging workers in Finland, teachers were identified as a target group. The reasons for this selection were the increased mental strain cited in teaching, and the general pattern of early retirement among teachers in Finland (Kinnunen, Rasku, & Parkatti, 1992). In a study designed to examine teacher stress during a school year, (Kinnunen, 1989) reported that 1 in 4 or 5 teachers indicated stress or overload by the job demands, this being more evident in those over 45 years of age. Sixty-eight percent of teachers in their sample perceived their health as good or fairly good, and ratings were found to be even higher

among physical education teachers.

Objectives of the Study

In the present study fitness level, serum lipid concentrations, physical activity habits, lifestyle behaviours, and life satisfaction of retired teachers were investigated, along with relationships among these measures. The primary objectives of the study were to:

1) describe measures of health (fitness level, blood lipids, physical activity participation, lifestyle habits, life satisfaction) among a sample of retired teachers.

2) interpret fitness levels, physical activity participation, and lifestyle habits of retired teachers according to associated *Estimated Health Benefit Zones*, established by the Canadian Physical Activity, Fitness and Lifestyle Appraisal (CSEP, 1996).

3) compare fitness levels to norms from the 1981 Canada Fitness Survey (CFS).

4) identify the relationship among physiological and self-report measures of health.

5) identify changes in this relationship as a function of age, age at retirement, and length of retirement.

Methodology

Sample

Forty retired elementary and high school teachers between the ages of 55 and 70 volunteered for the study, 24 women and 16 men. All teachers in the study had been retired from a full career in teaching for at least 1 year, and having satisfied criteria for the Ontario Teachers' Pension Plan, were receiving retirement benefits, as earned.

Acquiring study volunteers involved assistance from the Superannuated Teachers of Ontario (STO), an organization whose purpose and interests focus on teachers who have retired from teaching in Ontario. A request for volunteers, briefly outlining subject protocol, was placed in the quarterly STO newsletter. After receiving only two responses, a petition to participate was made at an annual STO meeting, where an additional 3 teachers offered to take part. These 5 individuals were asked to provide names of other retired teachers, each of whom was phoned individually and requested to participate in the study. A total of 40 individuals offered their time. This method of acquiring study volunteers was implemented for practical purposes, and as such, it has created an opportunistic sample, introducing the possibility of subject bias. It should be emphasized, however, that due to the uniformity of professional responsibilities, this sample is not markedly different from other teacher populations.

Procedures and Instrumentation

Interested volunteers attended a general meeting at which time participation criteria and full study details were explained. During the meeting individuals selected a suitable date and time for the fitness appraisal, and completed a number of self-report

questionnaires. All were compiled in random order so as to limit the possibility of response bias. Confidentiality of subject responses was assured at this time, and in an effort to guarantee anonymity, each participant was assigned an identification number which was utilized throughout the study. All study procedures were approved by the Lakehead University Ethics Committee for Research on Human Subjects.

During the study, retired teachers underwent a battery of physiological and self-report health measures. The physiological test battery included a fitness appraisal (measures of body composition, aerobic fitness, grip strength, flexibility) and a blood sample analysis of cholesterol and triglycerides. Self-report indices included the Healthy Physical Activity Participation Questionnaire (HPAPQ, see Appendix B), the Fantastic Lifestyle Checklist (FLC, see Appendix C), and the Salamon-Conte Life Satisfaction in the Elderly Scale (LSES, see Appendix D). Prior to acceptance in the study participants also completed the Physical Activity Readiness Questionnaire (PAR-Q, see Appendix A) as a screening procedure for safe completion of the performance items on the fitness test.

The fundamental goals of the Canadian Physical Activity, Fitness and Lifestyle Appraisal (CPAFLA) are to provide an assessment of three health components (major fitness parameters, physical activity participation, lifestyle behaviours and attitudes), and to interpret the appraisal results in terms of associated health benefits. *Estimated Health Benefit Zones* are on a graded scale from Excellent to Needs Improvement, suggesting a state of health associated with optimal health benefits to considerable health risks. The five health benefit zones are Excellent - *optimal* health *benefits*, Very Good - *considerable* health *benefits*, Good - *many* health *benefits*, Fair - *some* health *benefits* but also *some*

health *risks*, Needs Improvement - *considerable* health *risks*. The procedures are scientifically based and have been validated as accurate predictors of health status (CSEP, 1996; Shephard & Bouchard, 1994). In this study, results from the three major health components (physical fitness, physical activity participation, and lifestyle habits) were compared to CPAFLA health benefit zones.

Physiological Health Measures

Fitness appraisal.

Fitness testing was administered in the physiology laboratory at Lakehead University, School of Kinesiology, by Canadian Society of Exercise Physiology fitness consultants. The temperature in the lab at the time of testing was 22 degrees celcius, and all testing was completed within two days between the hours of 11:30am and 4:00 pm. All tests were conducted according to protocol outlined in the CPAFLA manual. Three fitness parameters are assessed in the CPAFLA appraisal; body composition, aerobic fitness, and musculoskeletal fitness. Results are then interpreted according to *Estimated Health Benefit Zones*.

An evaluation of body composition included anthropometric measurements of standing height (cm), weight (kg), waist girth (cm), and skinfold measurements (mm). Skinfold thicknesses were taken from five sites on the right side of the body (biceps, triceps, subscapula, iliac crest, medial calf) using Lafayette skinfold callipers. The mean of two measures from each site was recorded. Calculations were then made for body mass index (BMI), sum of 5 skinfolds, and sum of 2 trunk skinfolds.

Following the body composition assessment participants were outfitted with a heart

rate monitor (Polar Vantage XL) and blood pressure cuff (Trimline, PyMatt Corp.), and instructed to sit quietly for 5 minutes. After this time pre-exercise heart rate, systolic blood pressure, and diastolic blood pressure were recorded.

Determining aerobic fitness involved administering the modified Canadian Aerobic Fitness Test (mCAFT) as well as measurements of post-exercise heart rate and post-exercise blood pressure. The mCAFT is a progressive step test which entails stepping up and down on double 20.3 cm steps to a pre-set musical cadence based on age and gender. Participants completed one 3-minute stepping sequence and heart rate was measured immediately upon cessation of stepping. If the pre-determined ceiling post-exercise heart rate was not reached at this time participants proceeded to the next 3-minute stepping stage, after which time heart rate was monitored once again. Participants completed as many 3-minute bouts of stepping as were required to attain the ceiling post-exercise heart rate. Ceiling heart rates were set according to CPAFLA at 85% of age predicted maximum. Following the final stepping session, as determined by the post-exercise heart rate response and 2 minutes of walking around slowly, readings of post-exercise systolic and diastolic blood pressure were recorded. Blood pressure measurements were taken at two intervals; between 2:00 and 2:30 minutes and 3:30 and 4:00 minutes. Post-exercise heart rate was measured once again between 4:00 and 4:30 minutes. Aerobic fitness was determined by a prediction of maximal oxygen consumption using ceiling post-exercise heart rates attained.

Tests of musculoskeletal fitness comprised hand grip strength and trunk forward flexion. Grip strength in both the left and right hands was measured using a Lafayette

hand dynamometer. The maximum score on both the left and right hands was combined to provide an overall measure of grip strength. A laboratory manufactured sit and reach test board was used to evaluate static hip flexibility and measurements were made as positive values (cm) with reference to the dorsiflexed foot. The best of two trials was recorded.

Blood lipid concentrations.

Subjects were instructed to fast for 12 hours before arriving at the health appraisal site. Immediately prior to the fitness testing, 10 ml of blood was drawn from an antecubital vein via a vacutainer. Blood samples were collected in serum separator tubes containing no preservatives, while the participant remained seated. Within 3 hours of collection, blood specimens were centrifuged at 2500 revolutions per minute for 5 minutes, and serum was removed from the clot. A complete lipid profile, including measurements of total cholesterol (TC), triglycerides (TG), high density lipoproteins (HDL), and low density lipoproteins (LDL) was completed within 24 hours at McKellar Hospital Biomedical Lab. Tests for cholesterol and triglycerides were performed using *Vitros* Chemistry Calibrator Kit 2, and for HDL, the *Vitros* HDL Cholesterol Kit (Johnson & Johnson, 1996). Calculations were then made for both LDL and the ratio of total cholesterol to HDL (TC:HDL).

Self-Report Health Measures

Three self-report instruments were used to determine self-perceptions of health; Healthy Physical Activity Participation Questionnaire (HPAPQ), Fantastic Lifestyle Checklist (FLC), and Life Satisfaction in the Elderly Scale (LSES).

The HPAPQ is an index of health related fitness based on self-perceptions of frequency and intensity of physical activity behaviours, and of current fitness level (Shephard & Bouchard, 1994). The HPAPQ, taken from CSEP (1996) was recently validated (Shephard & Bouchard, 1994), and is used to establish a health benefit rating based on physical activity participation. A total score is computed and interpreted according to established *Estimated Health Benefit Zones*.

Lifestyle is an important determinant of health, and improving lifestyle is an important goal for achieving a better level of health (Wilson & Ciliska, 1984). The Fantastic Lifestyle Checklist (FLC) is a holistic lifestyle inventory (physical, emotional, social) consisting of the most prevalent health behaviours related to morbidity, mortality, and quality of life (Simpson, Albert, Wilson, Ciliska, & Evans, 1984). Another strength of the FLC is that only those everyday behaviours which the individual has the power to modify have been included in the assessment (Simpson et al., 1984; Wilson & Ciliska, 1984). These health and lifestyle issues which exert an important yet subtle influence on health, are grouped into nine main arenas of health; relationships with family and friends, activity level, nutrition habits, use of alcohol, use of tobacco and other drugs, stress level and sleep habits, behaviour/personality type, outlook on life, satisfaction with career/present role. The FLC provides insight into the values and habits that either support or hinder respondents' ability to integrate physical activity into their life. The FLC used in this study is part of CPAFLA, and has been adapted from an earlier research version of the FLC devised by Dr. Doug Wilson, department of family medicine, McMaster University. The inventory includes 25 questions scored on a 5-point Likert scale with

scores ranging from 0 to 4. Scores for each item are added to form a total possible score of 100, and are compared to *Estimated Health Benefit Zones*. Overall reliability of the FLC has been established as an index of lifestyle behaviours (Wilson, Nielson & Ciliska, 1984).

Designed to measure life satisfaction among the aged, the Life Satisfaction in the Elderly Scale (LSES) incorporates the greatest variety of items which have been proven to make up the construct of life satisfaction (Salamon & Conte, 1984). The LSES is comprised of eight categories, each focusing on a different construct of life satisfaction. The categories include Daily Activities - taking pleasure in daily activities, Meaning - regarding life as meaningful, Goals - goodness of fit between desired and achieved goals, Mood - positive mood tone, Self-concept - positive self-concept, Health - perceived physical well-being, Finances - degree of financial security, and Social Contacts - number and quality of social contacts). Each subscale includes 5 questions scored on a 5-point Likert scale with varying response anchors ranging from low to high satisfaction. The summation of points yields a maximum possible total of 5 points for each question, or 25 points per category. A total LSES, measuring overall well-being, is computed by adding together the eight subscale scores. The LSES has been validated using several approaches and is supported by high reliability data (r=.93) (Salamon & Conte, 1984).

Statistical Analysis

Data were analyzed using the SPSS statistical software (SPSS, 1993). Results from fitness tests, the Healthy Physical Activity Participation Questionnaire, and the Fantastic Lifestyle Checklist were interpreted according to CPAFLA *Estimated Health Benefit Zones*. Differences between women and men on fitness data were identified by

means of a t-test for independent samples. Two-tail bivariate correlations were computed using the Pearson Product Moment Correlation, in order to identify the association between physiological and self-report health measures, as well as between all health indicators and the variables of age, retirement length, and age at retirement. Two-tail correlations were utilised as a means of providing more conservative criteria regarding significance levels. Further investigations between physiological and self-report health were investigated using partial correlations controlling for age and gender.

Treatment of Data

In individual cases and for varying reasons, not all raw data were considered in the analyses. One participant, having had only a short career in teaching due to illness, was not representative of a retired teacher, and therefore was excluded from the study. Two individuals were absent for the fitness testing session, and consequently, only their self-report data were considered in the analyses. An elevated triglyceride value for one subject was an outlier in the results, and hence, the LDL level was unable to be computed. None of the blood values for this participant were retained. One individual was taking cholesterol medication at the time of testing, and once again, serum lipids were not included in the analysis. Two participants indicated they had eaten prior to providing a blood sample, thus these samples were not included in the analysis of blood lipids, however, all fitness and self-report measures were retained. For those FLC questionnaires with missing data on 1 or 2 questions, a total FLC score was computed by pro-rating the total score. Unfortunately, the affected subscales were left without a score.

Results

Sample Characteristics

Characteristics of the sample are presented in Table 1. The majority of participants were married and had a university degree with 32% of these also having a Master's degree. Respondents ranged in age from 55 to 70 years, most having spent a full career in the teaching profession and retiring in their mid 50s. Over half of the sample was female.

Table 1. Sample Characteristics (n = 40)

Characteristic	%		
Female	60		
Married	82.5		
University Degree	90		
Variable	**Mean**	**S.D.**	**Range**
Age	61.2	3.8	55-70
Years Teaching	33.6	4.7	18-42
Years Retired	4.8	3.3	1-11
Age at Retirement	56.4	2.4	53-62

Anthropometric and Fitness Measures

The mean scores for anthropometric and fitness measures are found in Table 2. As expected, women were significantly shorter, lighter in weight, weaker in grip strength, and lower in predicted $V0_{2max}$. They had smaller waist girth measurements, and were significantly better in trunk forward flexion. Women had significantly higher skinfold thicknesses, and a non-significantly higher BMI than the men.

According to guidelines established by the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure, women were healthy in both systolic

and diastolic blood pressure, with mean values less than 140 and 85 mmHg respectively, and men were in this range for systolic blood pressure only.

Table 2. Anthropometric and Fitness Data (n = 38)

	Women		Men		
Measure	Mean	S.D.	Mean	S.D.	t-value
Height(cm)	158.6	6.1	173.8	5.2	-8.06***
Weight(kg)	71.4	15.2	83.7	8.6	-2.91**
Heart Rate(Resting)	72.5	10.3	68.3	6.1	1.44
Systolic Blood Pressure/ mmHg(Resting)	125.9	9.6	136.1	11.4	-2.99**
Diastolic Blood Pressure/ mmHg(Resting)	82.2	5.9	85.5	8.5	-1.40
Waist Girth(cm)	86.7	12.7	94.9	7.9	-2.28*
Sum of 5 Skinfolds(mm)	93.0	26.7	63.4	17.4	4.01***
Sum of 2 Skinfolds(mm)	41.8	12.9	33.9	9.5	2.07*
Body Mass Index [weight(kg)/height^2(m)]	28.4	6.0	27.7	2.8	.42
Grip Strength(kg)	56.3	8.6	95.0	16.1	-9.61***
Trunk Forward Flexion(cm)	29.8	8.0	21.2	12.0	2.66**
Aerobic Fitness$^+$	304.4	59.1	395.1	73.7	-4.10***
VO_{2max} (ml/kg/min)$^{++}$	21.4	4.5	29.6	4.7	-4.57***

*p<.05 **p<.01 ***p<.001
+Based on CSEP, 1996
++computed using the CSTF Aerobic Calculator

A comparison of fitness measures to norms from the 1981 Canada Fitness Survey

(CFS) can be found in Table 3. All comparisons were made using one sample t-tests. Since the present sample was intermediate in age between the two age groupings selected for the CFS, findings from the present study were compared to gender-matched norms for those aged 50 to 59 and also to those aged 60 to 69. It should be recognized that the CFS 50-59 age range overlaps only partially with the present sample where the minimum age was 55. These norms, therefore, provide only an approximate basis for comparison.

An individual with a BMI between 25 and 30 is considered overweight but not obese. Therefore, although significantly higher on BMI than both age groups, women in this sample were within the same health range as the CFS women. Men, too, revealed significantly higher BMI values than those reported for men in both CFS age ranges but, once again, reflected the same state of health as CFS men on this measure. According to CSEP (1996), it is recommended that healthy BMI values for women and men aged 50 to 59 be between 21 and 25, and for those aged 60 to 69 between 21 and 27. In this sample, comparisons to CPAFLA health benefit zones revealed unhealthy mean BMI values of 28.4 and 27.7 for women and men respectively (see Table 2).

Significantly higher scores were found on both sum of 5 (SO5S) and sum of 2 skinfolds (SO2S) for women in this sample than either CFS women aged 50 to 59 or 60 to 69. In contrast, men in the present sample revealed similar values to those reported for CFS men in both the 50 to 59 and 60 to 69 age groups. Grip strength values for both women and men were significantly higher than the gender-matched CFS subjects aged 60-69, and approximated values for those tested in the 50-59 year age category. Trunk forward flexion levels were not significantly different from any of the CFS norms for either

women or men. With respect to predicted VO2max, women were significantly lower than the CFS women in the 50-59 year range but comparable to those aged 60-69. The men were intermediate between the two categories, being significantly lower than the CFS 50-59 year olds, and significantly higher than those aged 60-69. Overall, these findings reveal that the present sample of retired teachers was not substantially different from the general population on these fitness measures.

Table 3. Fitness Test Comparisons to Norms from the 1981 Canada Fitness Survey

Fitness Measure	Present Sample Mean (S.D.)	CFS Norms (50-59 yrs)	CFS Norms (60-69 yrs)
Women			
BMI [weight(kg)/ height^2(m)]	28.4 (6.0)	25.5**	25.6**
S05S(mm)	93.0 (26.7)	84.0*	82.0*
SO2S(mm)	41.8 (12.9)	33.0**	34.0**
Grip Strength (kg)	56.3 (8.6)	55.4	51.5*
Trunk Forward Flexion(cm)	29.8 (8.0)	29.5	27.6
V02max (ml/kg/min)	21.4 (4.5)	24.6**	21.6
Men			
BMI [weight(kg)/ height^2(m)]	27.7 (2.8)	26.0*	26.5*
SO5S(mm)	63.4 (17.4)	58.0	58.0
SO2S(mm)	33.9 (9.5)	33.0	33.0
Grip Strength (kg)	95.0 (16.1)	96.1	87.0**
Trunk Forward Flexion(cm)	21.2 (12.0)	23.8	22.1
V02max (ml/kg/min)	29.6 (4.7)	32.8**	27.0**

*p<.05 **p<.01

Fitness test comparisons to age- and gender-matched health benefit zones (CSEP, 1996) are presented in Table 4. Overall, teachers revealed healthy physical fitness levels. Approximately half of the sample scored Very Good to Excellent in both trunk flexion and grip strength, although 26% also Needed Improvement in grip strength. In reference to body composition, equal percentages of the sample were at either extreme of the scale,

with slightly less than one-third in each the Excellent and Needs Improvement category. Over 75% of the sample scored Good or higher in aerobic fitness, with almost 50% of these in the range of Very Good.

Table 4. Fitness Test Comparisons to Health Benefit Zones*

Fitness Measure	Health Benefit Zone	%
Grip Strength	Excellent	26.3
	Very good	26.3
	Good	10.5
	Fair	10.5
	Needs Improvement	26.3
Trunk Forward Flexion	Excellent	23.7
	Very Good	18.4
	Good	10.5
	Fair	23.7
	Needs Improvement	23.7
Body Composition	Excellent	31.6
	Very Good	10.5
	Good	13.1
	Fair	13.2
	Needs Improvement	31.6
Aerobic Fitness	Excellent	8.8
	Very Good	47.1
	Good	23.5
	Fair	8.8
	Needs Improvement	11.8

*Based on CSEP, 1996
Note: a *Health Benefit Zone* was determined for each participant individually (taking into account age and gender) and then summarized collectively in Table 4.

Blood Lipid Concentrations

Measurements of blood lipid concentrations are provided in Table 5. Approximately half of the sample was identified in the healthy range for LDL, and almost 100% scored within this range for both HDL and triglycerides. Strong evidence supports the ratio of total

cholesterol to HDL as the most meaningful measure of heart disease risk, and more than two-thirds were healthy on this measure. Total blood cholesterol was high with only slightly less than one-third in a healthy range. This finding is anomalous with the other blood measures which are all in the healthy range, and the reason for this low value is unclear.

Table 5. Blood Lipid Concentrations (n = 34)

Blood Measure	Mean	S.D.	Healthy Range*	% in Healthy Range
Total Cholesterol (mmol/L)	5.57	1.05	< 5.21	29.4
Triglycerides (mmol/L)	2.08	.77	< 2.84	94.1
LDL (mmol/L)	3.31	1.00	< 3.41	55.9
HDL (mmol/L)	1.31	.31	> 0.90	97.1
Total Cholesterol to HDL Ratio	4.46	1.28	< 5.00	67.6

* *Vitros* Manufacturing

Normative data for blood lipid concentrations in older adults is not available. Therefore, mean values of blood measures in the present sample were compared to those reported in four other recent studies of elderly individuals (Cunningham et al., 1987; Motoyama et al., 1995; Takeshima et al., 1993; Waller et al., 1992). Findings revealed that the present sample of retired teachers was not significantly different than the other samples in measures of total cholesterol (TC) and LDL. Triglyceride levels (TG) in the present sample were much lower than those reported in the other three studies. High density lipoprotein concentrations were found to be significantly higher than those observed in two of the other samples, but were lower than those found in the other

samples. The ratio of total cholesterol to HDL (TC:HDL ratio) was significantly lower than that found in one sample, but was also higher than the observed mean value in another sample. In general, these findings indicate that the present sample was intermediate among the other samples in all blood measures except triglycerides. Table 6 presents comparisons made using one sample t-tests.

Table 6. Comparisons of Blood Lipid Data to Other Studies

	Present Sample	Motoyama et al. (1995)	Waller et al. (1992)	Cunningham et al. (1987)	Takeshima et al. (1993)
Age	55-70 $\bar{x}$=61.2	$\bar{x}$=73.7	65-86	55-65 $\bar{x}$=62.5	60-79 $\bar{x}$=68.8
Gender	W=20 M=14	W=8 M=7	W=37 M=20	M=101	W=4 M=4
Blood Measure	Mean (SD)	Mean	Mean	Mean	Mean
TC(mmol/L)	5.57 (1.05)	5.28	5.75	5.81	5.59
TG(mmol/L)	2.08 (0.77)	3.99**	3.71**		2.98**
LDL(mmol/L)	3.31 (1.00)	3.29	3.64		3.39
HDL(mmol/L)	1.31 (0.31)	1.18*	1.35	1.16**	1.61
TC:HDL ratio	4.25 (1.28)	4.43	4.26	5.01*	3.47

*p<.05 **p<.01
W = Women; M = Men

Self-Report Health Measures

Participants responded to three questionnaires related to perceptions on various dimensions of health: physical activity participation, lifestyle habits, and life satisfaction.

Results from the Healthy Physical Activity Participation Questionnaire (HPAPQ) and

the FANTASTIC Lifestyle Checklist (FLC) were compared to *Health Benefit Zones* and are presented in Table 7. In almost half the cases, physical activity participation was rated as Excellent, and more than 90% scored Very Good or Excellent on lifestyle habits. No scores were within the Needs Improvement range for either measure.

Table 7. Comparisons of Healthy Physical Activity Participation Questionnaire (HPAPQ) and FANTASTIC Lifestyle Checklist (FLC) to Health Benefit Zones*

Health Measure	Maximum Possible Score	Mean	S.D.	Health Benefit Zone	%
HPAPQ	11	7.7	2.9	Excellent	43.6
				Very Good	33.3
				Good	15.4
				Fair	7.7
				Needs Improvement	0
FLC					
	100	79.8	6.4	Excellent	18.4
				Very Good	73.7
				Good	7.9
				Fair	0
				Needs Improvement	0

*Based on CSEP, 1996

Responses for each item on the FLC range on a scale from 0 to 4. Different anchors are utilized in each question, however, a score of 0 consistently indicates poor lifestyle behaviours (needs improvement) and a score of 4 reflects healthy behaviours (excellent). Percentages of the sample responding in each of five categories for each FLC subscale are presented in Table 8. No retired teachers in this sample felt the need for improvement in any of their lifestyle behaviours and attitudes. In 7 of the 9 FLC subscales (see Appendix C), over 80% felt their present lifestyle choices were either very good or excellent. The two scales where this was not the case included Activity (frequency of

moderate and vigorous physical activity) and TYPE of Behaviour (tendency toward Type A behaviour pattern), where only slightly more than 50% (51.5% and 53.8% respectively) fell in the very good and excellent ranges.

Table 8. Percentage of Sample Corresponding to each Degree of Lifestyle Behaviours for each FLC Subscale (n = 40)

FLC Subscale	Needs Improvement	Fair	Good	Very Good	Excellent
Family/ Friends		2.6	7.9	36.9	52.6
Activity		15.2	33.3	27.3	24.2
Nutrition			17.6	32.4	50
Tobacco/ Toxics				10.5	89.5
Alcohol		2.7	16.2	18.9	62.2
Sleep/ Seatbelts/ Stress/ Safe Sex				8.6	91.4
TYPE of Behaviour		2.6	43.6	48.7	5.1
Insight			10.5	57.9	31.6
Career			7.9	13.2	78.9
Total FLC				55.3	44.7

Questions on the LSES are answered on 5-point scales having varying response anchors. Some of the scales are bipolar (very unsatisfied, unsatisfied, average, satisfied,

very satisfied), while others are unipolar (never, rarely, sometimes, often, always). Similar to the FLC, however, one extreme reflects high life satisfaction and the other, low satisfaction. Teachers in this sample did not reveal below average life satisfaction on any of the 40 LSES questions. In over 70% of the cases, in fact, responses for all 8 subscales were rated as high or very high. On the subscales of finances and social contacts 100% were in this range. The percentage of responses in each category for each subscale is presented in Table 9.

Table 9. Percentage of Sample Corresponding to each Degree of Life Satisfaction for each LSES Subscale (n = 40)

LSES Subscale	Very Low	Low	Neutral	High	Very High
Daily Activities			5	60	35
Mood			2.5	65	32.5
Meaning			5	32.5	62.5
Goals			12.5	72.5	15
Self-Concept			2.7	81	16.2
Health			27.5	62.5	10
Finances				62.5	37.5
Social Contacts				55	45
Total LSES				61.5	38.5

Association Between Physiological and Self-Report Health Measures

The relationship between physiological and self-report variables was examined and correlations are provided in Table 10. Among the variables examined, several significant relationships were found, most with aerobic fitness. Aerobic fitness was moderately correlated with mood (r=.32), and demonstrated a substantial positive relationship to daily

activities (r=.43), meaning (r=.40), goals (r=.44), health (r=.47), and overall life satisfaction (r=.50). As aerobic fitness increased, individuals reported higher levels of these life satisfaction indicators. Two relationships were also uncovered with grip strength. A moderate positive association was found between grip strength and the variables of finances (r=.31) and daily activities (r=.32).

Table 10. Correlations among Physiological and Self-Report Health Measures

Health Measure	Grip Strgth.	Trunk Flex.	Body Comp.	Aerobic Fitness	Cholesterol /HDL Ratio
HPAPQ	.30	.09	.14	.28	-.11
Total FLC	-.08	-.06	.21	.14	.04
Total LSES	.22	.05	.08	.50**	.01
Daily Activities	.32*	.10	.04	.43**	.18
Mood	.12	.11	.19	.32*	.16
Meaning	.15	.05	.02	.40*	.10
Goals	.23	-.14	-.15	.44**	.02
Self-Concept	-.02	-.12	-.03	.17	-.17
Health	.04	.08	.21	.47**	-.07
Finances	.31*	.04	-.01	.14	.05
Social Contacts	-.07	.08	.08	.27	-.19

*p<.05 **p<.01

The relationships between physiological and self-report health measures were further investigated using partial correlations controlling for age and gender. Partial correlations revealed that in two cases, these significant relationships are not due to gender, and only two relationships appear to be explained by age. Therefore, the association between aerobic fitness and the self-report measures of life satisfaction and perceived health is not simply due to either age or gender. Partial correlations for all

significant relationships can be found in Table 11.

Table 11. Partial Correlations among Significant Physiological and Self-Report Health Measures, Controlling for Age and Gender

LSES Scale	Simple r	Controlling for Gender	Controlling for Age
Aerobic Fitness			
Total LSES	.50**	.39*	.46**
Daily Activities	.43**	_	.39*
Mood	.32*	_	_
Meaning	.40*	_	.37*
Goals	.44**	_	.37*
Health	.47**	.39*	.48**
Grip Strength			
Daily Activities	.32*	_	.35*
Finances	.31*	_	_

*p<.05 **P<.01

Association between Health Measures and the Variables of Age, Retirement Length, and Age at Retirement

Of the 40 individuals in this sample, 32 retired between the ages of 53 and 58, leaving only 8 who retired at age 60 or older. Thus, there was not a wide distribution of ages at retirement, and this measure was positively skewed towards age 55. Consequently, age and length of retirement were largely redundant in this sample ($r=.77$, $p<.001$). Correlations were examined between the variables of age, retirement length, and age at retirement, and all physiological and self-report variables. Only one significant relationship was found; a moderate negative association between retirement length and aerobic fitness ($r=-.38$, $p<.05$). As retirement length increased, aerobic fitness decreased.

Results are presented in Table 12.

Table 12. Correlations among Physiological and Self-Report Health Measures, and the Variables of Age, Retirement Length, and Age at Retirement

Health Measure	Age	Retirement Length	Age at Retirement
Grip Strength	.11	.17	-.08
Trunk Forward Flexion	-.07	-.06	-.02
Body Composition	.11	.22	-.13
Aerobic Fitness	-.32	-.38*	.05
Cholesterol to HDL Ratio	.05	.14	-.11
Healthy Physical Activity Participation Questionnaire	-.20	.09	.19
Fantastic Lifestyle Checklist	.15	.23	-.07
Life Satisfaction in the Elderly Scale	-.19	-.05	-.22

*P<.05

Discussion

The purpose of this study was to describe health, fitness, and life satisfaction in a sample of 40 teachers who were retired from elementary and secondary schools in Thunder Bay. Levels of physical fitness, blood lipids, participation in physical activity, lifestyle behaviours, and life satisfaction were examined. Retired teachers were found to be in good physical health, possess exceptionally healthy behaviours with respect to lifestyle and physical activity participation, and be extremely satisfied with retirement life. Fitness test comparisons to results from the 1981 Canada Fitness Survey (CFS) revealed that both women and men in this study were comparable and not markedly different than CFS gender-matched subjects. A comparison of blood lipids to other elderly samples revealed that this sample of retired teachers reflected similar values in all blood measures, but was significantly lower in triglycerides. According to the National Cholesterol Education Program (NCEP), mean levels of triglycerides, LDL, and HDL were found to be within healthy ranges, however, total cholesterol fell within the `borderline high' risk area (5.2-6.2 mmol/L). Aerobic fitness was highly correlated with life satisfaction, and this finding was not attributable to either age or gender.

It is important to address limitations about the representativeness of the present sample. It is not possible to obtain a random sample for a study such as this for one main reason; the need for informed consent. The reluctance of individuals to undergo fitness testing often limits participation in such studies. Another limitation to the study is the sampling method employed. A convenience sample was utilized, consisting of teachers who responded to an advertisement, and others whose names were suggested by these

first volunteers. Only one individual who was contacted by phone declined to participate when informed that fitness testing was involved. The mean age at retirement (56.4), years spent teaching (33.6), and the proportion of women to men (60%) were similar to provincial means (57.5, 33.6, 62% respectively) (personal communication, John Cappelletti, Ontario Teachers Pension Plan Board, 30 December, 1997).

One of the purposes of the present study was to examine the relationship of health related variables to age at retirement. Very few significant correlations were found. This may reflect the lack of variation in the age at retirement since the majority retired around age 56. This lack of variation is a limitation to the conclusions that can be drawn about age at retirement as a determinant of health.

The present study was also limited by the use of only one sample. This sample was compared to those in other studies having similar profiles. However, limitations in comparing these samples may impede the strength of conclusions drawn and, therefore, should be addressed. Although the results from the 1981 Canada Fitness Survey (CFS) were drawn on a population several years prior to this study, the CFS continues to be the largest study of its kind in Canada. The CFS was the most comprehensive national population survey of physical activity and fitness ever conducted (Stephens, Craig, & Ferris, 1986), and is representative of the Canadian population (Fitness Canada, 1986). Unfortunately the CFS norms are reflected in age ranges of 50 to 59 and 60 to 69, which do not correspond exactly to the age distribution of the present sample (55-70, mean=61.2). In addition, the CFS norms do not contain all of the health variables measured in this study, particularly blood lipids and self-report measures. Therefore,

whenever possible, other studies of elderly individuals were used for comparison purposes. Most of these studies involved subjects who were older than those in the present sample. In only one study was the mean age of the sample close to that of the present sample (Cunningham et al., 1987). In addition to assorted ages, the sample size and composition in these studies were also quite varied. They ranged from 8 to 101 subjects, and all but one study examined both women and men. Subjects in 2 of the 4 studies were Japanese (Motoyama et al., 1995; Takeshima et al., 1993), while those in the remaining two were white caucasian (Cunningham et al., 1987; Waller et al., 1992) as were those in the present study. In one study, the sample selected was a group of retired men from the province of Ontario (Cunningham et al., 1987) which is exactly from where retired teachers in the present sample were drawn.

Comparisons to studies with such differences may, at first, appear to create imprecision in conclusions. Despite the diversity of samples, however, results from the present study were generally quite similar to those reported in the others. Being one of few studies addressing the health of retired teachers, the present findings can be used as a basis for comparison in future studies of retired teachers where samples were similarly obtained, and also as a reference to guide future research in this area.

Physiological Health Measures

Physical Fitness Levels

Aerobic fitness is indicative of one's ability to carry on daily activities with less effort, leaving a sufficient reserve to allow for leisure activities and emergency situations (CSEP, 1996; McCulloch et al., 1994). When interpreted in terms of CPAFLA health benefit zones,

over 70% of the sample scored Good, Very Good, or Excellent in aerobic fitness, signifying an association with *many*, *considerable*, or *optimal* health benefits respectively. No scores fell in the Fair or Needs Improvement zone, providing evidence that no individuals in this sample are considered sedentary or extremely inactive (CPAFLA, 1996). This is also supported in the findings from comparisons to CFS subjects. Women in the present sample were significantly lower in $V0_{2max}$ in comparison to women aged 50-59 years, but were very similar to those aged 60-69 years. Men too, revealed significantly lower $V0_{2max}$ values than the CFS males aged 50-59, but significantly higher values than those aged 60-69. The mean age of the present sample (61.2) was between these two age groupings. Therefore, the finding that the mean fitness level was also intermediate supports the conclusion that the present sample was of average fitness level when compared to these norms.

When overall body composition of the present sample was interpreted according to CPAFLA health benefit zones, associations with both optimal benefits and considerable risks were reflected, having equal percentages at both ends of the health benefit continuum. A greater proportion of the sample, however, had a health rating of Good or better, as opposed to Fair and Needs Improvement combined. Establishing the health benefit rating for body composition takes into consideration that an individual may have a high body mass index (BMI) due to greater muscle mass and not overfatness. This may partially account for the acceptable health benefit zones regarding overall body composition, yet the (seemingly contradictory) unhealthy BMI observed in this sample. Comparisons to CFS norms revealed that women in this sample were significantly higher

than CFS women aged 50 to 59 and 60 to 69 on all body composition measures; BMI, sum of 5 skinfolds (SO5S), and sum of 2 skinfolds (SO2S). Men in this study were significantly higher than both CFS age groups in BMI only, and were comparable in both skinfold measures. Adults aged 50-59 and 60-69 with a BMI greater than 25 and 27 respectively are considered to be at increased risk of developing health problems (Canadian Guidelines for Healthy Weights, 1988, cited in McCulloch et al., 1994). The average BMI for both women (28.4) and men (27.7) in this group of retired teachers indicates increased possibility of health concerns. The elevated BMI in the present study was also observed in other research on the elderly (Gillett et al., 1995; McCulloch et al., 1994), but was found to be lower than that reported in far more studies involving elderly individuals (Cunningham et al., 1987; Pearson et al., 1985; Wong et al., 1990). In contrast to the present study, McCulloch et al. (1994) found that rural Saskatchewan men aged 65-69 had significantly higher scores than CFS norms on all three body composition measures, whereas women from the same geographical area were significantly higher on SO5S only. When compared to the actual values reported by McCulloch et al. (1994) for elderly aged 65 to 69, women in the present study were higher in all body composition measures, and men in this study were lower on these three measures.

Grip strength of retired teachers was represented equally in three health benefit zones; Excellent, Very Good, and Needs Improvement. Half of the sample demonstrated values associated with considerable and optimal health benefits, but almost one-third demonstrated a level of grip strength denoting a clear need for improvement. When findings from the present study were compared to CFS age- and gender-matched norms,

both women and men were significantly higher than subjects in the 60-69 year age range. In spite of poor grip strength in some individuals, the overall findings in this sample were higher than in other studies of grip strength in retired individuals (Cunningham et al., 1987; McCulloch et al., 1994). McCulloch et al. (1994) observed grip strength values for elderly men and women which were lower than the CFS norms, but not significant. Cunningham et al. (1987) found that grip strength decreased over the first year of retirement. Their study involved men only, and even the initial baseline scores reported in both activity (85.0) and control (86.0) groups were lower than those found for men in this sample of retired teachers (95.0). (The grip strength values for the left and right hands in their study were combined for ease of comparison to grip strength values in the present study). The variations in grip strength, found with retired teachers in the present study, may be suggestive of changes in lifestyle upon reaching the retirement age. For some, in particular, the daily physical tasks of a job and lifestyle associated with the maintenance of muscular strength are no longer required in retirement. For others there is the possibility that new ventures either promoted, or allowed for the maintenance of pre-retirement levels of grip strength. Those retired teachers falling in the Fair or Needs Improvement category would benefit tremendously from a modest resistance training program.

As researchers have pointed out, improvements in flexibility have been observed following exercise intervention (Cunningham et al., 1987; Voorrips et al., 1993). The fact that over 50% in this study were categorized as Good or higher suggests that these teachers are participating in appropriate activities for the maintenance of healthy levels of

flexibility. While slightly more than half of the sample demonstrated sound flexibility, however, 47% of the sample had health benefit ratings of either Fair or Needs Improvement. This is indicative of either low levels of physical activity (CSEP, 1996; McCulloch et al., 1994; Voorrips et al., 1993), or the sheer lack of attention to a flexibility regimen during periods of exercise and physical activity. When compared to results from the Canada Fitness Survey, teachers in this sample were not significantly different than either the 50-59 or the 60-69 year age range on measures of hip flexion. The present study reported a mean trunk flexion value for men of 21.2. This value was far higher than those found by Cunningham et al. (1987) in both a control group (11.6) and an activity group (11.4).

It is worthwhile to note the percentage of the sample falling in the Excellent health benefit zone for each of the fitness measures. Over 20% were in this range for grip strength, trunk forward flexion, and body composition, yet just under 9% of the sample was considered Excellent in aerobic fitness. In addition to the variables of frequency and duration, and unlike all other fitness components, improvements in aerobic fitness require a minimum level of exercise intensity (70-90% of age-predicted maximum heart rate) (CSEP, 1996). Many health benefits can be gained at moderate intensities (60-70% maximum heart rate), however, and not necessarily be related to improvements in aerobic fitness. The plausible explanation for the small number of teachers in the Excellent range for aerobic fitness, is that teachers are not *training* their aerobic system during regular daily activities. Their objective could be to achieve levels of fitness which serve to meet the needs of their daily activities, and maintain a functional level of health, rather than

achieve fitness excellence. In any case, this small percentage suggests the need for longer excercise programs of increased intensity and duration.

A summary of fitness findings shows that, in the case of this sample of retired teachers, they are moderate in overall fitness level and comparable to the general population.

Blood Lipid Concentrations

Mean values for all blood lipids except total cholesterol (TC) fell within the range considered healthy. Only 29% of the sample, however, was within a desirable range for TC, and according to the National Cholesterol Education Program (NCEP), the mean value of 5.57 observed in this sample is considered `borderline high'. Blood cholesterol levels are maintained by either diet or medication, of which diet is the sole modifiable risk factor. Therefore, teachers in this sample exhibiting undesirable levels of TC may consider diet modifications such as decreasing the intake of high cholesterol foods or altering the ratio of saturated to unsaturated fats in the diet (consuming higher amounts of unsaturated foods). It should be recognized that only 15% of the cholesterol in the body is provided by diet, with the remaining amount reflecting genetic influence (Calbreath, 1992). Therefore the cholesterol values observed may largely be a result of genetics, and those who do not respond to alterations in diet may require medical intervention to lower total cholesterol levels.

Healthy measures of triglycerides were reported in 94% of retired teachers in this sample. In comparison to three other studies of elderly participants (Cunningham et al., 1987; Motoyama et al., 1995; Takeshima et al., 1993), triglyceride levels in the present

sample were also significantly lower. The exact reason for this is unclear. One outlier triglyceride value (7.53) was deleted, however, even if this value had been included in the analysis, the mean value of this sample would have been 2.24. This is still far lower than reported triglyceride values in the other comparison samples. According to guidelines established by the NCEP, values observed in the other three studies were considered `borderline high', in contrast to the present sample where values fell in a range designated as healthy or `desirable'. Moderate positive effects on triglycerides have been demonstrated following low and high intensity aerobic exercise (Jiang, 1984; Motoyama et al., 1995). Healthy concentrations of triglycerides in this sample therefore, may be indicative of moderate levels of aerobic exercise participation by these retired teachers. These levels may also reflect a superior diet by the retired teachers in this sample, and, as with all lipid levels may result from a genetic predisposition. The data relating triglyceride levels to heart disease are not clear. However, it is apparent from the healthy triglyceride level observed in this sample that these retired teachers have no added risk for cardiovascular disease (Calbreath, 1992).

The percentage of teachers in the healthy range for LDL cholesterol was 55.9, and LDL levels approximated those reported in three other studies of the elderly (Motoyama et al., 1995; Takeshima et al., 1993; Waller et al., 1992). HDL values, however, were significantly higher than in studies by both Motoyama et al. (1995) and Cunningham et al. (1987). The presence of estrogens appears to contribute to a higher amount of HDL reported in women than in men (Calbreath, 1992). Since the number of women in the present sample was far greater than in either of the other two studies reporting lower HDL

levels (Cunningham et al., 1987 considered only men), this may partly account for the higher values observed. Waller et al. (1992) also studied a sample of elderly people with similar proportions of women to men as the present study. They too, observed HDL values (1.35) similar to those found in this sample of retired teachers (1.31). Exercise is generally thought to have a beneficial effect on cholesterol metabolism through lowering LDL cholesterol, while increasing HDL cholesterol (Calbreath, 1992; Waller et al., 1992). Perhaps retired teachers in this sample who exercised did so at adequate intensities and/or durations to elicit healthy levels of HDL and LDL cholesterol. It must also be considered that there is a strong genetic component to the levels of HDL and LDL cholesterol in an individual (Calbreath, 1992), and this may partially account for differences observed between the groups compared.

There appears to be a contradiction or discrepancy in the percentage of the sample exhibiting healthy levels of the total cholesterol to HDL (TC:HDL) ratio (67.6), and those with a healthy total cholesterol (TC) level (29.4). Almost two-thirds were found to have healthy TC:HDL ratios, whereas only one-third revealed healthy levels of TC. This is a result of the unique information provided by each measure. The ratio of total cholesterol to HDL is thought to be the most accurate index of risk for coronary artery disease (Leon, 1987; McArdle, Katch, & Katch, 1996; Pollock & Wilmore, 1990; Wilmore and Costill, 1994), with values greater than 5.0 indicating high risk. It appears to be a better predictor of CHD than any other lipid component alone (Leon, 1987). In this sample of retired teachers, the mean TC:HDL value of 4.46 lies within a healthy range. In comparison to other samples of elderly, this value was similar to those reported in two other studies of

the elderly (Motoyama et al., 1995; Waller et al., 1992), significantly higher than that reported by Takeshima et al. (1993), and significantly lower than the value by Cunningham et al. (1987), where only men were tested. Decreases in TC:HDL ratios have been observed following both low intensity and strenuous aerobic activity (Frey et al., 1990; Motoyama et al., 1995). This sample of teachers demonstrated average and healthy levels of aerobic fitness, suggestive of desirable exercise habits. This exercise behaviour is a possible contributor to the healthy TC:HDL ratio observed.

Self-Report Health Measures

Physical Activity Participation

Significant health benefits are derived from participation in moderate-intensity physical activity (CSEP, 1996). For almost half of the sample in this study, the health benefit rating on the Healthy Physical Activity Participation Questionnaire (HPAPQ) was Excellent, implying that physical activity participation was at a level generally associated with optimal health benefits. None of the sample fell within the Needs Improvement range.

Canada's 1990 Health Promotion Survey revealed that as education, income, and occupational status increased, active use of leisure time was more common (CSEP, 1996). These factors may be contributors to the high self-rated levels of physical activity participation reported by teachers in this study. In this sample exercise participation was perceived to be of a frequency and level of intensity conducive to the maintenance of good health and fitness. Retirees in this sample also indicated having positive perceptions regarding their fitness level. Studies have reported higher self-rated health with increased income (Kolanowski and Gunter, 1988) and regular physical activity (Kolanowski & Gunter,

1988; Wilmore & Costill, 1994). In all likelihood, the adequate retirement income and the apparent regular physical activity of teachers in this sample partially account for the high self-rating of health and fitness levels.

With the exception of CPAFLA health-benefit zones, no norms were found for the HPAPQ. Two studies did report data from this instrument (Shephard & Bouchard, 1994; Shephard & Bouchard, 1994), however, an alternative scoring method was used. Consequently, no comparisons were made between this study and others, on the measure of self-report physical activity participation.

Lifestyle Behaviours

In addition to health benefits associated with physical activity participation and fitness status, evidence supports the substantial influence of various lifestyle behaviours on health (Fitzgerald, Litt, Ciliska, Belmore, & Butson, 1984; Sherk, Thomas, Wilson, & Evans, 1984). The major causes of disability and death in Canada are no longer considered to be infectious diseases but rather `diseases' of lifestyle (CSEP, 1996). The FANTASTIC Lifestyle Checklist (FLC) considers factors which affect physical, emotional, and social health and well-being. The mean score on the FANTASTIC Lifestyle Checklist in this sample corresponded to an overall health benefit rating of Very Good (79.8%). When further categorized, 73.7% and 18.4% of the sample fell in the Very Good and Excellent ranges respectively. No teachers in this sample reported lifestyle habits and values in either Fair or Needs Improvement ranges.

As evidenced by the *Activity* subscale, slightly more than 50% of the sample participated in moderate or vigorous physical activity 4 or more times per week

(corresponding to a health benefit rating of Very Good or Excellent). Of those participating less frequently than this, however, 33.3% of the sample exercised 3 times per week, and only only 15.2% reported exercising less than the minimum recommendation of 3 times per week.

The patterns of smoking behaviour in this sample are similar to those found Nationally (Sharratt, Sharratt, Smith, Howell, & Davenport, 1984) and are extremely positive. The majority of the sample (89.5%) reported having used no tobacco in the last 5 years. The remainder of the sample had not used any tobacco product within the past year.

Alcohol related problems have a major impact on health, and therefore, the effect of alcohol on quality of life is substantial (Fitzgerald et al., 1984). More than 60% of the teachers in this sample reported an average alcohol intake of 0-7 drinks in a week, `never' drinking more than 4 drinks on one occasion, and `never' drinking after driving. This is representative of responsible use of alcohol by this sample (CSEP, 1996; Wilson et al., 1984).

In addition to the positive habits regarding alcohol, the majority of the sample (91.4%) indicated `almost always' receiving adequate sleep (7-9 hours per night), `always' using seatbelts, `almost always' coping well with stressful events and enjoying leisure time, and `always' using methods to prevent sexual diseases.

Type of behaviour was found to lean away from a Type A personality style. A sense of time urgency and easily aroused hostility were reported `some of the time' by just less than 50% of the sample, and `seldom' or `almost never' by slightly more than half.

With respect to career, 100% of the sample was satisfied either `fairly often' (13.2%) or `almost always' (78.9%) with their present role. This is supportive of the enjoyment of retirement life by this sample of retired teachers.

Healthy living has a significant influence on reducing the risk of disease and enhancing health and well-being, and lifestyle components evaluated in the FLC are those which exert a subtle but powerful influence on health (Deobil, 1989; Fitzgerald et al., 1984; Morgan et al., 1991; Shephard, 1982; Sherk et al., 1984). Scores from the FLC reveal that these retired teachers are representative of living a lifestyle comprised of behaviours and values, which contribute to physiological gains, positive mental health status and quality of life (Deobil, 1989).

There is no gold standard with which to validate the FLC, and no norms could be located for it. Three studies were found, however, which applied the FANTASTIC Lifestyle Checklist (Sharratt et al., 1984; Simpson et al., 1984; Wilson et al., 1984). The mean FLC of the present sample (79.8) was higher than the means in each of these studies (75.3, n=253, Sharratt et al., 1984; 73.9, n=779, Simpson et al., 1984; 67.0, n=21, Wilson et al., 1984). The version of the FANTASTIC Lifestyle Checklist used in these studies was one from which the FLC in the present study was adapted, and unfortunately contained slightly different questions. In spite of the near exactness of the FLC inventories used in these studies, therefore, the slight difference in question wording and sequencing hindered the possibility of drawing strong conclusions from these comparisons.

In summary, while findings from the HPAPQ and the FLC from this study could not be compared to norms, the findings will form part of a developing data base on these

instruments, and may be useful for future comparisons in other studies using these self-report questionnaires.

Life Satisfaction

Results from the Life Satisfaction in the Elderly Scale (LSES) provide evidence of extremely high levels of life satisfaction in this sample of retired teachers. No individuals reported low or very low levels of satisfaction on any of the subscales (see Table 9).

Adequate finances has been identified as a meaningful predictor of life satisfaction during retirement (Riddick, 1985; Seccombe & Lee, 1986). Ontario teachers have a strong pension plan which provides adequate retirement income, and teachers in this sample reported being extremely satisfied with their degree of financial security. Satisfaction with financial security was 1 of 2 subscales where responses from all participants were categorized as either high or very high (see Table 9). This high level of satisfaction with finances is consistent with other studies reporting a positive association between income and retirement satisfaction (Odell et al., 1992; Riddick, 1985; Seccombe & Lee, 1986).

The other LSES subscale where 100% of the sample rated their satisfaction as high or very high was Social Contacts. The teaching profession involves a high degree of social interaction by teachers with both peers and students. Some occupations may prepare one better for the transition to retirement than others. George (1977) claimed that those in higher-status occupations tend to work with people, which may contribute to their being better prepared for the transition from employment to the social context of retirement. Because of the nature of the job, the social skills developed by teachers are likely transferable to the social environment often surrounding retirement. Consequently,

it is not surprising that a high degree of satisfaction was found with this area of life.

It has also been demonstrated that retirees who are married reveal higher life satisfaction than those who are not married (Odell et al., 1992; Seccombe & Lee, 1986). The high percentage of married teachers in this sample (82.5) is another likely contributor to the positive life satisfaction ratings observed.

Few studies were found where the LSES was used in evaluating life satisfaction in an elderly population. Of these few, only one study interpreted LSES data in a way which allowed direct comparisons to the present study. Weiss (1994) compared the efficacy of cognitive group therapy and life review group therapy in 48 adults, aged 50 to 100, living in a long-term care setting. On completion of an 8-week therapy program, Weiss (1994) found that residents assigned to both therapy groups reported a higher score on the LSES Meaning subscale than the control group. The Meaning score reflected improved feelings of purpose and usefulness in the lives of cognitive and life review therapy participants.

When compared to results from Weiss (1994), teachers in the present study revealed a significantly higher score on the Meaning scale (20.3) than either the cognitive, life review, or control group (19.1, 19.4, 15.1 respectively). Higher scores on the Meaning scale observed in the present sample can be explained in a couple of ways. Being in a long-term care facility is generally out of financial or health related necessity, rather than choice (Weiss, 1994). Retired teachers are in a completely different position in life. They have a satisfactory income and freedom of choice, and may have more positive attitudes toward their present situation in life than do residents in a personal care home. Feeling useful and having a sense of purpose is also reflected in the Meaning subscale, and

individuals in a long-term care home may equate life here with the `buying of time'. In contrast, retired teachers in this study have dedicated themselves to years of teaching (on average 33.6), and may feel a sense of accomplishment as a result. Unlike nursing home residents in the study by Weiss (1994), all teachers in this sample were healthy and mobile. This too, may contribute to a feeling of purpose and usefulness, and consequently, the higher score observed on this life satisfaction scale.

Association Between Physiological and Self-Report Health Measures

The relationship between physiological and self-report health measures revealed that aerobic fitness, the most useful indicator of physical health status (CSEP, 1996), was highly correlated with life satisfaction ($r=.50$, $p<.01$), and several of the LSES subscales. Aerobic fitness was significantly correlated with the subscales of Daily Activities, Mood, Meaning, Goals, and Perceived Health. Partial correlations were used to determine whether these relationships were artifacts of either age or gender. For example, older persons might be both less fit and less satisfied. In controlling for gender, the relationship between aerobic fitness and both perceived health and total life satisfaction remained significant. When age was controlled, only one correlation (mood) became non-significant. Therefore, neither age nor gender were the sole variables explaining these relationships.

Health is a major contributor to life satisfaction (Brown, 1992; Kozma & Stones, 1983; Morris, 1989; Spreitzer et al., 1979-80), and activity has been identified as partially explaining the variation in life satisfaction (Morris, 1989). Research on the elderly has demonstrated positive relationships between fitness and self-rated health, as well as measures of life satisfaction and well-being in general (Hawkins & Anderson, 1996;

McMurdo & Burnett, 1992; Morris, Fortunato, & spittle, 1996). For example, McMurdo and Burnett (1992) followed elderly volunteers (aged 60-81) through a 32-week aerobic exercise program, and found that subjects reported increases in perceived health on follow-up. When compared to a non-exercise group, exercisers also revealed significantly higher life satisfaction. As well, Bravo, Gauthier, Roy, and Payette (1996) investigated the impact of a 12-month exercise program on physical health and self-perceived health in women aged 50 to 70. Women reported increases in self-perceived health and a significant difference in psychological well-being when compared to age-matched controls. Aenchbacher, Dishman, and Tieman (1991) also reported a positive relationship between inactivity and self-rated depression in a group of 95 women aged 60 to 86.

The present findings are consistent with these previous studies and confirm the association between fitness and quality of life during retirement.

Age, Retirement Length, and Age at Retirement

One of the objectives of this study was to examine age at retirement as a variable influencing health during the retirement years. No significant relationships were found. However, there was little variability in the range of retirement ages (53-62). Most (80%) retired between 53 and 58 years of age, with only 8 of the 40 participants older than age 58 at the time of retirement. The non-significant findings may have resulted from this restriction of age ranges. Therefore, issues related to whether early ages of retirement enhance either fitness level or life satisfaction could not be adequately addressed in this study.

Relative to retirement pensions in other occupations, those earned by teachers

allow an early and financially independent exit from the teaching profession. With the recent inception of the 85 factor, (age and total years teaching combined; June, 1998), there will be yet an earlier retirement exodus by teachers, since most retire immediately when eligible (all teachers in this sample retired prior to the instatement of the 85 factor during a time when the 90 factor was effective). As a result of this continuing trend of early retirement, therefore, it may be that teachers are simply not a good population on which to study the influence of age at retirement on health and well-being. Studying this factor in a population having greater diversity in age at retirement would illuminate this issue at a more in-depth level.

Regarding age at retirement, also noteworthy is the fact that of those teachers in this sample retiring older than age 58, 7 were women and only 1 was a man. Prior to 1977, women who left their teaching responsibilities to have children were forced to resign, thus losing any accumulated seniority upon their return to teaching. In so doing, these women forfeited the right to continue paying into a pre-established pension fund, resulting in an insufficient number of teaching years to allow retiring with a 90 factor. As a result, some women in this study remained in the profession longer than early retirement allowed, and retired in their early 60s. Since this regulation regarding pregnancy is no longer in place, we will see increasingly more women retiring at the same early ages as men.

Correlations between length of retirement and all physiological and self-report variables showed few significant relationships. Length of retirement did reveal a moderate negative correlation with aerobic fitness. Since length of retirement is confounded by age (Bossé et al., 1987), it is difficult to assess its overall impact. Because of the limited range

of retirement ages, these findings are suspect, and further research is needed which includes a larger sample of individuals who do not retire at such early ages.

Recommendations for Future Research

The notion that retirement is a time of rest and reduced activity levels, unhappiness and low morale was not supported in this study. On the contrary, retired teachers are fit, healthy, and satisfied with life. A number of questions still remain which were not answered by the present study. One question concerns the benefits of early versus late retirement. The limited range of retirement ages in the present study prevented a clear answer to this question. As well, whether or not retired teachers differ on health and fitness indicators prior to, and following retirement, is uncertain. Do teachers in fact become more or less sedentary following retirement? Another worthy issue is the possible differences in physical activity and lifestyle behaviours between working and retired teachers. Comparing employed teachers approaching retirement to those presently retired may help to uncover general patterns of activity which influence health in the retirement years.

Other issues which might be addressed are whether the lifestyle values and health practices of retired teachers differ from those of retired white-collar workers not in the teaching profession. Perhaps it is the profession which mediates the retirement-health association rather than the event of retirement itself. Also, a comparative analysis of retired teachers in other regions of Ontario and in different provinces may determine if geographical location influences health and fitness levels.

Conclusions

The present study provided comprehensive descriptive information about the physiological and self-report health of retired teachers. Based on the fitness components measured, the physical health of retired teachers was found to be similar to the general population, and associated with Good to Excellent health ratings. In addition, concentrations of all blood lipids, with the exception of total cholesterol, were in healthy ranges. Results from self-report questionnaires indicated that teachers were extremely satisfied with their life circumstances, and had desirable physical activity and lifestyle habits. These findings are indicative of positive health behaviours and fitness measures in this sample of retired teachers.

Findings from this study may offer individuals the opportunity and justification to alter some of the less desirable behaviours in their life, with the anticipation of enjoying a long and healthy retirement. Teachers, as well as the general public, could be encouraged to become more aware of and question personal lifestyle and exercise habits. Personnel instrumental in setting work schedules, defining working conditions, and implementing retirement policies in other professions may also benefit from the findings of this study. Because quality of life in the retirement years is significantly influenced by good health, it is important that this information be in the public domain.

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Appendix A

Physical Activity Readiness Questionnaire

Physical Activity Readiness
Questionnaire - PAR-Q
(revised 1994)

PAR - Q & YOU

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO		
☐	☐	1.	Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?
☐	☐	2.	Do you feel pain in your chest when you do physical activity?
☐	☐	3.	In the past month, have you had chest pain when you were not doing physical activity?
☐	☐	4.	Do you lose your balance because of dizziness or do you ever lose consciousness?
☐	☐	5.	Do you have a bone or joint problem that could be made worse by a change in your physical activity?
☐	☐	6.	Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
☐	☐	7.	Do you know of any other reason why you should not do physical activity?

If you answered

YES to one or more questions

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

NO to all questions

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:

- start becoming much more physically active — begin slowly and build up gradually. This is the safest and easiest way to go.
- take part in a fitness appraisal — this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively.

DELAY BECOMING MUCH MORE ACTIVE:

- if you are not feeling well because of a temporary illness such as a cold or a fever — wait until you feel better; or
- if you are or may be pregnant — talk to your doctor before you start becoming more active.

Please note: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

You are encouraged to copy the PAR-Q but only if you use the entire form

NOTE: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction.

NAME _____

SIGNATURE _____ DATE _____

SIGNATURE OF PARENT _____ WITNESS _____
or GUARDIAN (for participants under the age of majority)

continued on other side...

Supported by: Health Canada Santé Canada

...continued from other side

PAR - Q & YOU

We know that being physically active provides benefits for all of us. Not being physically active is recognized by the Heart and Stroke Foundation of Canada as one of the four modifiable primary risk factors for coronary heart disease (along with high blood pressure, high blood cholesterol, and smoking). People are physically active for many reasons — play, work, competition, health, creativity, enjoying the outdoors, being with friends. There are also as many ways of being active as there are reasons. What we choose to do depends on our own abilities and desires. No matter what the reason or type of activity, physical activity can improve our well-being and quality of life. Well-being can also be enhanced by integrating physical activity with enjoyable healthy eating and positive self and body image. Together, all three equal VITALITY. So take a fresh approach to living. Check out the VITALITY tips below!

Active Living:

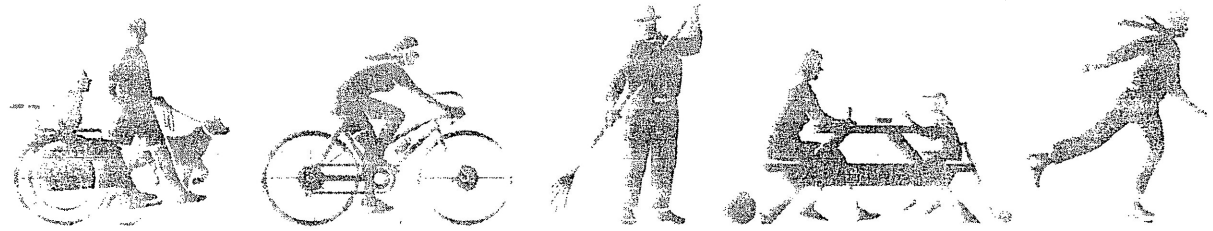
- accumulate 30 minutes or more of moderate physical activity most days of the week
- take the stairs instead of an elevator
- get off the bus early and walk home
- join friends in a sport activity
- take the dog for a walk with the family
- follow a fitness program

Healthy Eating:

- follow Canada's Food Guide to Healthy Eating
- enjoy a variety of foods
- emphasize cereals, breads, other grain products, vegetables and fruit
- choose lower-fat dairy products, leaner meats and foods prepared with little or no fat
- achieve and maintain a healthy body weight by enjoying regular physical activity and healthy eating
- limit salt, alcohol and caffeine
- don't give up foods you enjoy — aim for moderation and variety

Positive Self and Body Image:

- accept who you are and how you look
- remember, a healthy weight range is one that is realistic for your own body make-up (body fat levels should neither be too high nor too low)
- try a new challenge
- compliment yourself
- reflect positively on your abilities
- laugh a lot



Enjoy eating well, being active and feeling good about yourself. That's VITALITY.

FITNESS AND HEALTH PROFESSIONALS MAY BE INTERESTED IN THE INFORMATION BELOW.

The following companion forms are available for doctors' use by contacting the Canadian Society for Exercise Physiology (address below):

The **Physical Activity Readiness Medical Examination (PARmed-X)** - to be used by doctors with people who answer YES to one or more questions on the PAR-Q.

The **Physical Activity Readiness Medical Examination for Pregnancy (PARmed-X for PREGNANCY)** - to be used by doctors with pregnant patients who wish to become more active.

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***To order multiple printed copies of the PAR-Q,** please contact the*

Canadian Society for Exercise Physiology
185 Somerset St. West, Suite 202
Ottawa, Ontario CANADA K2P 0J2
Tel. (613) 234-3755 FAX: (613) 234-3565

The original PAR-Q was developed by the British Columbia Ministry of Health. It has been revised by an Expert Advisory Committee assembled by the Canadian Society for Exercise Physiology and Fitness Canada (1994).

Disponible en français sous le titre «Questionnaire sur l'aptitude à l'activité physique - Q-AAP (revisé 1994)».

Supported by: Health Canada Santé Canada

Appendix B

Healthy Physical Activity Participation Questionnaire

FIGURE 4-6 HEALTHY PHYSICAL ACTIVITY PARTICIPATION QUESTIONNAIRE

#1 Frequency

Over a typical seven-day period (one week), how many times do you engage in physical activity that is sufficiently prolonged and intense to cause sweating and a rapid heart beat?

- ☐ At least three times
- ☐ Normally once or twice
- ☐ Rarely or never

#2 Intensity

When you engage in physical activity, do you have the impression that you:

- ☐ Make an intense effort
- ☐ Make a moderate effort
- ☐ Make a light effort

#3 Perceived Fitness

In a general fashion, would you say that your current physical fitness is:

- ☐ Very good
- ☐ Good
- ☐ Average
- ☐ Poor
- ☐ Very Poor

Appendix C

FANTASTIC Lifestyle Checklist

FIGURE 5-3 FANTASTIC LIFESTYLE CHECKLIST

INSTRUCTIONS: Unless otherwise specified, place an 'X' beside the box which best describes your behaviour or situation in the past month. Explanations of questions and scoring are provided on the next page.

FAMILY FRIENDS	I have someone to talk to about things that are important to me	almost never		seldom		some of the time		fairly often		almost always
	I give and receive affection	almost never		seldom		some of the time		fairly often		almost always
ACTIVITY	I am vigorously active for at least 30 minutes per day e.g., running, cycling, etc.	less than once/week		1-2 times/week		3 times/week		4 times/week		5 or more times/week
	I am moderately active (gardening, climbing stairs, walking, housework)	less than once/week		1-2 times/week		3 times/week		4 times/week		5 or more times/week
NUTRITION	I eat a balanced diet (see explanation)	almost never		seldom		some of the time		fairly often		almost always
	I often eat excess 1) sugar, or 2) salt, or 3) animal fats, or 4) junk foods.	four of these		three of these		two of these		one of these		none of these
	I am within ____kg of my healthy weight	not within 8 kg		8 kg (20 lbs)		6 kg (15 lbs)		4 kg (10 lbs)		2 kg (5 lbs)
TOBACCO TOXICS	I smoke tobacco	more than 10 times/week		1 - 10 times/week		none in the past 6 months		none in the past year		none in the past 5 years
	I use drugs such as marijuana, cocaine	sometimes								never
	I overuse prescribed or 'over the counter' drugs	almost daily		fairly often		only occasionally		almost never		never
	I drink caffeine-containing coffee, tea, or cola	more than 10/day		7-10/day		3-6/day		1-2/day		never
ALCOHOL	My average alcohol intake per week is____ (see explanation)	more than 20 drinks		13-20 drinks		11-12 drinks		8-10 drinks		0-7 drinks
	I drink more than four drinks on an occasion	almost daily		fairly often		only occasionally		almost never		never
	I drive after drinking	sometimes								never
SLEEP SEATBELTS STRESS SAFE SEX	I sleep well and feel rested	almost never		seldom		some of the time		fairly often		almost always
	I use seatbelts	never		seldom		some of the time		most of the time		always
	I am able to cope with the stresses in my life	almost never		seldom		some of the time		fairly often		almost always
	I relax and enjoy leisure time	almost never		seldom		some of the time		fairly often		almost always
	I practice safe sex (see explanation)	almost never		seldom		some of the time		fairly often		always
TYPE of behaviour	I seem to be in a hurry	almost always		fairly often		some of the time		seldom		almost never
	I feel angry or hostile	almost always		fairly often		some of the time		seldom		almost never
INSIGHT	I am a postive or optimistic thinker	almost never		seldom		some of the time		fairly often		almost always
	I feel tense or uptight	almost always		fairly often		some of the time		seldom		almost never
	I feel sad or depressed	almost always		fairly often		some of the time		seldom		almost never
CAREER	I am satisfied with my job or role	almost never		seldom		some of the time		fairly often		almost always

STEP 1	Total the X's in each column	→	☐		☐		☐		☐		☐	
STEP 2	Multiply the totals by the numbers indicated (write your answer in the box below)	→	0		x 1		x 2		x 3		x 4	
STEP 3	Add your scores across the bottom for your grand total	→			☐	+	☐	+	☐	+	☐	= ☐

Grand total
(see explantion)

Appendix D

Life Satisfaction in the Elderly Scale

Life Satisfaction Scale

Michael J. Salamon and Vincent A. Conte

Name _____ Date _____

Age _____ Sex _____ Marital Status _____

INSTRUCTIONS

Printed on the following pages are statements which tell us your feelings about life in general. Mark an "**X**" over the word or phrase to the right of each statement which is closest to the way you feel. Answer all 40 items.

EXAMPLE

	very boring	boring	average	satisfying	very satisfying
1. My daily routine is:	____	X	____	____	____
	never	almost never	sometimes	often	always
2. I am most satisfied with my life situation:	____	____	X	____	____

1. My daily routine is:	very boring	boring	average	satisfying	very satisfying
2. I am most satisfied with my life situation:	never	almost never	sometimes	often	always
3. I think about what I would like to accomplish:	very often	often	sometimes	seldom	never
4. I am ___ in a bad mood.	always	often	sometimes	seldom	never
5. Physically I am:	unhealthy	somewhat unhealthy	average	healthy	very healthy
6. I take medication:	very often	often	sometimes	seldom	never
7. I have enough money to enjoy myself:	never	rarely	sometimes	often	always
8. I try to spend time with people:	never	rarely	sometimes	often	always
9. I have ___ friends.	no	few	some	many	a great many
10. I generally plan ___ activities.	no	few	some	many	a great many
11. In general I feel:	very unsatisfied	unsatisfied	average	satisfied	very satisfied
12. I feel pain:	always	often	sometimes	seldom	never
13. Compared to any other time in my life, I am now:	very unsatisfied	unsatisfied	average	satisfied	very satisfied
14. In my life I have achieved:	nothing	very little	something	a lot	a great deal
15. How important are you to others:	not at all important	of little importance	somewhat important	important	very important

16. Being with other people is____ pleasurable.	never	rarely	sometimes	often	always
17. My current income is:	very inadequate	inadequate	fairly adequate	adequate	very adequate
18. I find the company of others to be:	very uncomfortable	usually uncomfortable	somewhat comfortable	usually comfortable	very comfortable
19. I worry about finances:	always	often	sometimes	seldom	never
20. My financial situation is:	very bad	bad	fair	good	excellent
21. In looking back, I feel that I have done____ of the things that I've wanted to do.	very few	few	some	almost all	all
22. My schedule of activities is:	very unsatisfying	not really satisfying	occasionally satisfying	satisfying	very satisfying
23. As I look back on my life, I am:	completely dissatisfied	dissatisfied	partially satisfied	satisfied	very satisfied
24. The things I do every day give me:	no pleasure	little pleasure	some pleasure	a lot of pleasure	a great deal of pleasure
25. My usual mood is:	severe depression	mild depression	sometimes happy	usually happy	always happy
26. My intelligence is:	far below average	below average	average	above average	superior
27. My physical appearance is:	very unattractive	somewhat unattractive	average	somewhat attractive	very attractive
28. I am generally:	quite ill	ill	in average health	healthy	very healthy

PLEASE CONTINUE ON NEXT PAGE

29. The time I spend with friends is:	completely unsatisfying	usually unsatisfying	sometimes satisfying	usually satisfying	always satisfying
30. People say that I am:	very moody	often moody	sometimes moody	usually in good spirits	always in good spirits
31. My present situation is:	very difficult	difficult	I get by	pleasurable	very pleasurable
32. When it comes to taking care of myself, I:	totally depend on others	often depend on others	am sometimes independent	am usually independent	am always independent
33. I regard my life as:	without meaning	having little meaning	having some meaning	meaningful	very meaningful
34. People think that I am financially well off:	never	rarely	sometimes	often	always
35. I visit my doctor:	very often	regularly	sometimes	rarely	almost never
36. I am happy with the way things turn out:	never	almost never	sometimes	often	very often
37. I consider myself to be:	always pessimistic	usually pessimistic	sometimes pessimistic	usually optimistic	always optimistic
38. I am ____ with my outlook on life.	very dissatisfied	dissatisfied	somewhat dissatisfied	satisfied	very satisfied
39. I am satisfied with the way things are:	never	almost never	sometimes	often	very often
40. I am pleased with my daily activities:	never	seldom	sometimes	usually	always

Appendix E

Correlations among Physiological Health Measures

Correlations among Physiological Health Measures

	Aerobic Fitness	Body Composition	Grip Strength	Trunk Forward Flexion	TC:HDL Ratio
Aerobic Fitness	1.00	.35*	.39*	.10	-.18
Body Composition	.34*	1.00	.00	.36*	-.33*
Grip Strength	.39*	.00	1.00	-.34*	.16
Trunk Forward Flexion	.10	.36*	-.34*	1.00	-.11
TC:HDL Ratio	-.18	-.33*	.16	-.11	1.00

*p<.05

Appendix F

Correlations among Self-Report Health Measures

Correlations among Self-Report Health Measures

	Total LSES	Daily Activities	Mood	Meaning	Goals
Total LSES	1.00	.75***	.72***	.90***	.73***
Daily Activities	.75***	1.00	.56***	.82***	.57***
Mood	.72***	.56***	1.00	.66***	.42**
Meaning	.90***	.82***	.66***	1.00	.74***
Goals	.73***	.57***	.42**	.74***	1.00***
Self-Concept	.48**	.25	.06	.46**	.43**
Health	.48**	.19	.35*	.25	.25
Finances	.57***	.25	.34*	.36*	.23
Social Contacts	.63***	.32*	.38*	.55***	.41**
Total FLC	.67***	.49**	.57***	.59***	.45**
Family/ Friends	.53***	.49**	.37*	.61***	.30
Activity	.37*	.46**	.23	.32	.18
Nutrition	.24	.17	.11	.16	.04
Tobacco/ Toxics	-.04	-.09	-.25	-.13	.02
Alcohol	-.28	-.19	-.24	-.20	-.31
Sleep/ Seatbelts/ Stress/ Safe Sex	.48**	.09	.28	.41**	.52***
TYPE of Behaviour	.28	.16	.43**	.18	.38*
Insight	.64***	.45**	.82***	.53***	.38*
Career	.58***	.60***	.30	.72***	.57***
HPAPQ	.40*	.28	.36*	.20	.09

*p<.05 **p<.01 ***p<.001

	Self-Concept	Health	Finances	Social Contacts	Total FLC
Total LSES	.48**	.48**	.57***	.63***	.67***
Daily Activities	.25	.19	.25	.32*	.49**
Mood	.06	.35*	.34*	.38*	.57***
Meaning	.46**	.25	.36*	.55***	.59***
Goals	.43**	.25	.23	.41**	.45**
Self-Concept	1.00	.14	.22	.24	.43**
Health	.14	1.00	.16	.05	.46**
Finances	.22	.16	1.00	.36*	.40**
Social Contacts	.24	.05	.36*	1.00	.26
Total FLC	.43**	.46**	.40**	.26	1.00
Family/ Friends	.54***	.19	.09	.31	.54***
Activity	.09	.37*	.11	.07	.37*
Nutrition	.31	.30	.27	-.10	.57***
Tobacco/ Toxics	-.02	-.03	.10	.22	.27
Alcohol	.02	-.20	-.08	-.18	.25
Sleep/ Seatbelts/ Stress/ Safe Sex	.58***	.25	.15	.35*	.28
TYPE of Behaviour	-.27	.35*	.11	.03	.30
Insight	.20	.29	.46**	.22	.59***
Career	.43**	.00	.25	.32*	.28
HPAPQ	.12	.49**	.29	.10	.26

*p<.05 **p<.01 ***p<.001

	Family/ Friends	Activity	Nutrition	Tobacco/ Toxics	Alcohol
Total LSES	.53***	.37*	.24	-.04	-.28
Daily Activities	.49**	.46**	.17	-.09	-.19
Mood	.37*	.23	.11	-.25	-.24
Meaning	.61***	.32	.16	-.13	-.20
Goals	.30	.18	.04	.02	-.31
Self-Concept	.54***	.09	.31	-.02	.02
Health	.19	.37*	.30	-.03	-.20
Finances	.09	.11	.27	.10	-.08
Social Contacts	.31	.07	-.10	.22	-.18
Total FLC	.54***	.37*	.57***	.27	.25
Family/ Friends	1.00	.41*	.17	-.01	.04
Activity	.41*	1.00	.33	-.03	-.23
Nutrition	.17	.33	1.00	-.03	.01
Tobacco/ Toxics	-.01	-.03	-.03	1.00	.44**
Alcohol	.04	-.23	.01	.44**	1.00
Sleep/ Seatbelts/ Stress/ Safe Sex	.32	-.02	-.09	-.28	-.20
TYPE of Behaviour	-.23	-.04	.01	.08	-.19
Insight	.27	.01	.21	-.16	-.17
Career	.27	-.17	.01	-.13	-.14
HPAPQ	.17	.69***	.25	-.07	-.30

*p<.05 **p<.01 ***p<.001

	Sleep/ Seatbelts/ Stress/ Safe Sex	TYPE of Behaviour	Insight	Career	HPAPQ
Total LSES	.48**	.28	.64***	.58***	.40*
Daily Activities	.09	.16	.45**	.60***	.28
Mood	.28	.43**	.82***	.30	.36*
Meaning	.41*	.18	.53***	.72***	.20
Goals	.52***	.38*	.38*	.57***	.09
Self-Concept	.58***	-.27	.20	.43**	.12
Health	.25	.35*	.29	.00	.49**
Finances	.15	.11	.46**	.25	.29
Social Contacts	.35*	.03	.22	.32*	.10
Total FLC	.28	.30	.59***	.28	.26
Family/ Friends	.32	-.23	.27	.27	.17
Activity	-.02	-.04	.01	-.17	.69***
Nutrition	-.09	.01	.21	.01	.25
Tobacco/ Toxics	-.28	.08	-.16	-.13	-.07
Alcohol	-.20	-.19	-.17	-.14	-.30
Sleep/ Seatbelts/ Stress/ Safe Sex	1.00	-0.3	.39*	.32	.02
TYPE of Behaviour	-.03	1.00	.41**	.07	.19
Insight	.39*	.41**	1.00	.34*	.18
Career	.32	.07	.34*	1.00	-.05
HPAPQ	.02	.19	.18	-.05	1.00

*p<.05 **p<.01 ***p<.001

Appendix G

Correlations among Physiological Health Measures and Subscales of the FANTASTIC Lifestyle Checklist

Correlations among Physiological Health Measures and Subscales of the FANTASTIC Lifestyle Checklist

	Aerobic Fitness	Body Composition	Grip Strength	Trunk Forward Flexion	TC:HDL Ratio
Family/ Friends	-.24	.14	-.06	.20	-.04
Activity	-.26	.30	.19	-.03	-.03
Nutrition	-.38*	.59***	.11	.09	-.18
Tobacco/ Toxics	-.16	-.14	-.09	-.08	-.02
Alcohol	-.52**	-.16	-.38*	.02	.27
Sleep/ Seatbelts/ Stress/ Safe Sex	-.10	-.24	-.14	-.17	-.14
TYPE of Behaviour	.26	-.20	.07	-.18	.03
Insight	.11	.09	.08	.12	.12
Career	.21	-.15	.20	-.08	.11

*p<.05 **p<.01 ***p<.001