

5-2003

# Profiling Employees Participation in Employer Sponsored Fitness Programs in Maine

Wendy-Jo Berube

Follow this and additional works at: <http://digitalcommons.library.umaine.edu/etd>

 Part of the [Kinesiology Commons](#), and the [Organizational Behavior and Theory Commons](#)

---

## Recommended Citation

Berube, Wendy-Jo, "Profiling Employees Participation in Employer Sponsored Fitness Programs in Maine" (2003). *Electronic Theses and Dissertations*. 474.

<http://digitalcommons.library.umaine.edu/etd/474>

This Open-Access Thesis is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of DigitalCommons@UMaine.

PROFILING EMPLOYEES PARTICIPATION IN EMPLOYER  
SPONSORED FITNESS PROGRAMS IN MAINE

By

Wendy-Jo Berube

Bachelor of Science University of Maine, 1998

A THESIS

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Science

(in Kinesiology and Physical Education)

The Graduate School

University of Maine

May 2003

Advisory Committee:

Robert Lehnhard, Associate Professor of Education, Advisor

Phil Pratt, Ed. D., Associate Director, Office of Institutional Studies

Stephan A. Butterfield, Professor of Education and Special Education

PROFILING EMPLOYEES PARTICIPATION IN EMPLOYER  
SPONSORED FITNESS PROGRAMS IN MAINE

By Wendy-Jo Berube

Thesis Advisor: Dr. Robert Lehnhard

An Abstract of the Thesis Presented  
in Partial Fulfillment of the Requirements for the  
Degree of Master of Science  
(in Kinesiology and Physical Education)  
May 2003

Comprehensive health promotion and disease management programs have evolved significantly over the last two decades in both large and small worksites. Research over this time period has yielded plenty of evidence proving health promotion programs can produce tangible outcomes. Studies have repeatedly demonstrated that comprehensive worksite health promotion programs can lower employee health care and insurance costs, decrease absenteeism, and improve job performance and productivity. Despite the well-known benefits of regular exercise, previous research has also shown that participation and adherence rates in worksite health promotion programs have been unsatisfactory. This study was conducted to profile employee participation in worksite fitness programs across the state of Maine involving both government (n=6) and private (n=7) organizations.

Out of a possible 5193 employees surveyed, 1467 (28 percent) answered a questionnaire regarding their activity level at work (70.5 percent sitting, 17.1

percent walking, 12.4 percent heavy labor), their frequency of exercise (61 percent three or more days/week) and their duration of exercise (80.8 percent more than 20 minutes/session). Only 8.9 percent reported that their employers provided no form of financial support for a personal fitness program.

When the responses were divided into two groups (government and private), a Chi Square test found a significant difference ( $p < .05$ ) in the jobsite activity level, and the amount of financial support provided to employees for pursuing an exercise regime. A Chi Square test was also performed to compare the level of physical activity while on the job (sitting, walking, heavy labor), to the employees' frequency, duration and history of personal exercise, as well as to the level of financial support for personal fitness provided by the employers. Significant differences ( $p < .05$ ) were found in all of these comparisons.

In summary, the results of this study show an unusually high percentage of workers that exercise a minimum of three days a week for at least 20 minutes each session. These results were significantly different from Chi Square predicted values. Possible explanations for this difference include the low number of surveys returned (28 percent), and/or the rural environment in the State of Maine provides greater opportunities for personal exercise in the form of outdoor recreation than those found in an urban setting.

## TABLE OF CONTENTS

List of Tables.....	iii
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: REVIEW OF LITERATURE... ..	6
CHAPTER 3: METHODOLOGY.....	17
A. Introduction.....	17
B. Research Design.....	17
C. Subjects .....	18
D. Procedures.....	18
E. Statistical Analysis.....	21
CHAPTER 4: RESULTS.....	22
CHAPTER 5: DISCUSSION.....	34
REFERENCES.....	42
APPENDIX A: Health Survey.....	44
APPENDIX B: Heart Check.....	47
BIOGRAPHY.....	53

## LIST OF TABLES

<i>Table</i>	<i>Title</i>	<i>Page</i>
1	Physical Activity Questions.....	20
2	Jobsite Activity Level.....	23
3	Physical Activity Frequency (Days/Week).....	23
4	Physical Activity Duration (Minutes).....	24
5	Physical Activity History.....	24
6	Physical Activity Opportunity Provided by Employer.....	25
7	Financial Support for Physical Activity.....	26
8	Jobsite Activity: Government vs. Private Sector.....	27
9	Physical Activity Frequency: Government vs. Private Sector .....	28
10	Physical Activity Duration: Government vs. Private Sector.....	28
11	Physical Activity History: Government vs. Private Sector.....	29
12	Financial Support for Physical Activity: Government vs. Private Sector.....	30
13	Jobsite Activity Level vs. Physical Activity Frequency.....	30
14	Jobsite Activity Level vs. Physical Activity Duration.....	31
15	Jobsite Activity Level vs. Physical Activity History.....	32
16	Jobsite Activity Level vs. Physical Activity Opportunity Provided by Employer.....	32
17	Jobsite Activity vs. Financial Support.....	33

## *Chapter 1*

### **INTRODUCTION**

Health is a positive concept emphasizing social and personal resources, as well as physical capacities. It goes beyond healthy lifestyles to complete well-being and is not just the responsibility of allied health professionals. Health Promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental, and social well being, an individual or group must be able to identify and to realize aspirations, satisfy needs, and change or cope with the environment. Health, therefore, is seen as a resource of everyday life, not the objective of living.

Since regular physical activity helps prevent disease and promote health, it has provided the basis for worksite health promotion programs for years. Workplace physical activity programs can reduce short-term sick leave by six to 32 percent, reduce health care costs by 20 to 55 percent, and increased productivity by two to 52 percent. Physical inactivity and its associated health problems have substantial economic consequences for the U.S. health care system. In the long run, physical inactivity threatens to reverse the decades-long progress that has been made in reducing the morbidity and mortality associated with many chronic conditions such as cardiovascular disease. (22)

A study performed by researchers at the Centers for Disease Control and Prevention found that physically active people had, on average, lower annual direct medical costs than did inactive people. The same study estimated that increasing regular moderate physical activity among the more than 88 million inactive Americans over the age of 15 years might reduce the annual national direct medical costs by as much as \$76.6 billion in 2000 dollars. (15) Further, it

found that physically active people had fewer hospital stays and physician visits and used less medication than physically inactive people.

With exercise as a base, comprehensive health promotion and disease management programs have evolved significantly over the last two decades in both large and small worksites. These programs are not restricted to only exercise regimes; they also include environmental and social support for healthy behaviors and conditions. In addition, they are geared toward building awareness, knowledge, skills, and interpersonal support for personal behavior change. These programs hold the promise of reducing the burden of ill health, moderating medical care costs, and improving positive health in all dimensions. Therefore, it is important to review what support and conditions health promotion programs at the worksite can provide. In many respects, worksites are opportune settings, for delivering risk factor interventions because they provide ready access to working populations, the opportunity for promoting environmental supports for behavior change, and natural structures for social support. In addition, health related policies could be made within the organization to influence lifestyle changes.

There is compelling evidence that a sizable portion of the billions of dollars currently spent by employers on health-related costs is preventable by means of health promotion programming. Well-planned, comprehensive health programs have been shown to be cost-effective, especially when the health promotion programming is matched to the health problems of the specific employee population. (13) A number of studies provide evidence of lower medical and insurance costs for participants in health promotion programs, particularly programs involving exercise. For \$30 per person, the Bank of America conducted a health promotion program for retirees using a risk assessment questionnaire, self-care books and other mailed materials. Insurance claims were

reduced an average of \$164 per year in this group while they increased \$15 for the control group. Since they were able to document significant changes in risk behavior, they anticipate greater savings in future years. (4)

General Motors, in conjunction with the United Auto Workers, jointly developed and implemented their *Life-Steps Program* in 1996. The program employed a two-pronged approach to programming that maintained low-risk individuals, while also reducing the number of high-risk individuals. All 1.2 million GM employees, retirees and independents aged 19 or older were eligible to participate in at least some portion of the program. It was found that a greater decrease in the number of health risks was observed with increased program participation.

A number of other large corporations have reported similar savings in health care costs as a result of worksite health promotion programs. Pacific Bell's *FitWorks* participants claim \$300 less per case than their non-participant counterparts for a one-year total savings of \$700,000 (3). Coca Cola reported a reduction in health care claims with an exercise program alone, saving \$500 per employee per year for the employees (60 percent) who joined their *HealthWorks* fitness program. (24) Prudential Insurance Company reports that the company's major medical costs dropped from \$574 to \$312 for each participant in its wellness program. (19)

Johnson & Johnson began the *Live for Life program* in 1978 to improve the health and well being of its employees. The mission of the program was to encourage employees to accept responsibility for their own health and well being by providing employees and their families with resources and opportunities that would result in healthier lifestyles. From 1979 through 1983, the company experience hospitalization claims at one-third the rate of comparative

companies. (14). Another positive result from this program was significant positive changes in employee attitude in the categories of organizational commitment, supervision, working conditions, job competence/security, and pay/benefits. (9)

Other employers have documented similar attitude changes in employees participating in health promotion programs. They report improvement in job attitude, work performance, energy level, and/or overall morale among program participants—all critical factors in enhancing productivity. (6) In a Canadian government study, the Canada Life Assurance Company experimental group realized a 4 percent increase in productivity after starting an employee fitness program, compared to the control group. Further, 47 percent of program participants reported that they felt more alert, had better rapport with their coworkers, and generally enjoyed their work more. (17) Swedish investigators found that mental performance was significantly better in physically fit workers than in non-fit workers. Fit workers committed 27 percent fewer errors on tasks involving concentration and short-term memory, as compared with the performance of non-fit workers. (18)

Worksite health promotion is a relatively new phenomenon that is an attempt, at one level, to increase revenues and decrease costs through improving employee health. The workplace is becoming a popular venue for delivering health promotion services. Each year, more companies become receptive to new programs and policies designed to promote employee health and prevent illness. The past three decades have yielded plenty of evidence proving health promotion programs can produce tangible outcomes. Studies have repeatedly demonstrated that comprehensive worksite health promotion programs can lower health care and insurance costs, decrease absenteeism, and improve performance and productivity. In fact, there are presently more than 500 studies documenting the

health and financial impact of health promotion programs. (8) Previous research has shown that despite the well-known benefits of regular exercise, participation and adherence rates in worksite health promotion programs have been unsatisfactory. This study was performed to profile participation in programs across the state of Maine involving both private (retail, hospital, factory, manufacturing, and financial institutions) and government (city, state agency's, educational institutions, municipalities) organizations.

## *Chapter 2*

### **LITERATURE REVIEW**

Regular physical activity, fitness, and exercise are critically important for the health and well being of people of all ages. Research has demonstrated that virtually all individuals can benefit from regular physical activity, whether they participate in vigorous exercise or some type of moderate health-enhancing physical regime. (18) Regular physical activity has been shown to reduce the morbidity and mortality from many chronic diseases. (11) Millions of Americans suffer from chronic illnesses that can be prevented or improved through regular physical activity.

Despite the well-known benefits of physical activity, most adults and many children lead a relatively sedentary lifestyle and are not active enough to achieve these health benefits. A sedentary lifestyle is defined as engaging in no leisure-time physical activity (exercises, sports, physically active hobbies) in a two-week period. Data from the National Health Interview Survey shows that in 1997-98 nearly four in 10 (38.3 percent) adults reported no participation in leisure-time physical activity. (23) A study conducted in 1993 by Prat, Macera, and Wang indicated 14 percent of all deaths in the United States were attributed to activity patterns and diet. A similar study in 1998 by Hahn, Teusch, and Rothenburg linked sedentary lifestyles to 23 percent of deaths from major chronic diseases. (7)

Over the last 20 years, the dominant outcome of interest in health promotion has been medical costs. Studies that measure the impact of programs in terms of medical dollars saved, including return-on-investment (ROI), are the gold standard for the worksite health promotion field. This narrow focus is reasonable,

given the double-digit inflation rate of health care costs in the U.S. over the same period and the saliency of this issue for most business managers.

Union Pacific Railroad (UPRR) has nearly 48,000 employees in 23 states throughout the U.S. Most of these employees are mobile, unionized, blue-collar workers. In 1990, UPRR determined that twenty-nine percent of their health care costs were lifestyle related (compared to a national average of nineteen percent), and that medical costs per employee were nearly double the national average. With this in mind, UPRR began a self-care initiative at an annual cost of \$50 per person. This initiative asked employees and their spouses to complete a health assessment and then enroll in a follow-up program designed specifically to meet their state of readiness to alter health habits, learning styles, and risk factors. After careful implementation, the program achieved a net savings of \$1.26 million—a benefit cost ratio of \$2.77 returned for every \$1 invested.

Health risks were dramatically improved as well. Forty-five percent of employees in the treatment group lowered their risk of high blood pressure, thirty percent moved out of the at risk range for weight problems, and twenty-one percent stopped smoking. After five years of targeted health promotion activities, UPRR has reduced the rate of lifestyle related health costs from twenty-nine percent to twenty-four percent. What's more, they estimate that they have saved three times as much money through indirect productivity savings as they have in direct medical costs. (2)

Highsmith Inc. is also a great example of how a well-designed health promotion program can produce favorable bottom-line outcomes. Located among the cornfields of rural Fort Atkinson, Wisconsin, Highsmith is a \$55-million business that sells products to libraries and schools by catalog. The company employs approximately 300 people. Eighty percent of its employees are

women, and the average age is 39. Highsmith's wellness program began in 1989 when they realized that their group health insurance premiums had increased by fifty-three percent. It was then that Highsmith began an aggressive wellness program that, to date, has included building a walking path around its campus and offering its "mini-university," a program that enables employees to sign up for a wide variety of continuing education classes—many of which are offered on company time. Highsmith's concept of total employee wellness has enabled the company to bargain with its insurance provider, negotiating little, if any, increase in yearly health insurance premiums. Employee satisfaction at Highsmith has reached new heights as well. A recent employee retention study revealed that the average length of employment at Highsmith was 14 years. (5)

Rockhill, Willett, and Manson, et al conducted a study that examined the association between recreational physical activity and mortality in middle-aged and older women and the possibility that physical activity serves as an important marker of health. Analyses were conducted among participants in the Nurses' Health Study. Levels of physical activity were assessed by questionnaire in 1980 and updated every 2 to 4 years.

The levels of physical activity an individual performed were inversely associated with his/her risk of dying. However, each activity level above the reference level had approximately the same level of risk reduction (20-30 percent). The inverse association was stronger for cardiovascular deaths than for cancer deaths and was strongest for respiratory deaths. Women also died of non-cardiovascular, non-cancer causes were more likely to have reported that poor health limited their physical activity than were women who died of other causes or who remained alive. (18)

Considerable evidence suggests that increased physical activity reduces the risk of disease and mortality. The ordinary inference is that this association reflects a direct causal relationship. However, the reverse inference could be made; namely, that serious disease causes low physical activity. Rockhill, Willett, and Manson, et al conducted the Nurses Health Study in an attempted to decrease the magnitude of potentially illegitimate associations through the imposition of analytical constraints. More than 85,000 nurses' physical activity levels, morbidity and mortality rates were examined over a 16-year period. Findings from this study indicated an inverse relationship between total mortality and level of total physical activity. Stratification by hours walked per week showed that more vigorous physical activity was associated with a moderate (20-25 percent) reduction in mortality risk. Deaths among women at the lowest activity level were more likely to be due to non-cancer, non-cardiovascular causes (such as respiratory disease, cirrhosis, and diabetes) than were deaths among women at the highest activity level (29 percent vs. 20 percent). (15) The limitations to this study include; nurses' may not be representative of the entire population of U.S. women, self-reported measures of physical activity may not be accurate, and there may be a false component in the relationship between physical activity and mortality that could not be removed through conventional analytic approaches. (18)

A study by Martinson, O'Connor, and Pronk was conducted to ascertain the relationship of physical inactivity and short-term all cause mortality in a prospective cohort of randomly selected managed care organization members aged 40 years and older who had multiple chronic diseases. A clinical database from the year 1994 was used to identify all health plan members aged 40 years and older with two or more chronic health conditions (hypertension, coronary heart disease, diabetes mellitus, or dyslipemia). Random samples of 2336 members were surveyed by mail and telephone interview regarding their health-

related behaviors. Survey data were linked to mortality data from the 1995 to 1997 Minnesota Death Index. Cox proportional hazards regression was used to ascertain the association between physical inactivity and subsequent all cause mortality, adjusting for potential confounders. (10)

Members who reported less than 30 minutes a week of physical activity at baseline had a higher mortality risk ratio (2.82) vs. those with 30 or more minutes of physical activity a week (2.14). Increased mortality risk persisted after adjustments for age, sex, current smoking, functional impairment, and co-morbidity score. In adults with chronic diseases, the physically inactive had higher observed mortality within a 42-month period than those who were active. The results of this study indicate that if physical inactivity reflects an independent mortality risk, efforts to maintain physical activity in such patients may yield significant clinical benefits within a short period. By contrast, if inactivity is primarily a proxy for other factors that elevate mortality risks, a simple physician inquiry regarding inactivity may help to identify patients at risk of death. (10)

Another study by Martinson, O'Connor, and Pronk done in 1993 estimated the impact of the Citibank Health Management Program on changes in health risks among Citibank employees. The Citibank health management Program was introduced in 1994 and repeated in 1996. Over half of eligible employees participated in the program, with 9234 employees responding to two or more health risk appraisals (HRA). The study examined change in 10 risk factors measured by the HRA. A pre-post analysis employed data from participants who completed two or more HRA surveys in order to examine the proportion of participants at high risk at their initial HRA compared with their latest HRA. Health risks declined over time for 8 of the 10 risk categories (seatbelt use, exercise habits, fiber intake, stress levels, fat intake, salt intake, cigarette use, and diastolic blood pressure). Obesity however, worsened significantly. A more

intensive intervention program was also offered to high-risk employees; a second analysis employed a quasi-experimental design to compare high-risk program participants with non-participants who completed the HRA. The high risk intervention produced statistically significant reductions in nine risk categories, but results were limited in magnitude and variable across risk categories (ranging from 8.7 percent risk reduction for exercise habits to .6 percent reduction for fat intake).

Logistic regression controlled for baseline differences in subsequent analyses when those who participated in more intensive program features were compared with those who participated in less intensive features. Most changes were small, except those related to exercise habits, seatbelt use, and stress levels. For nine health risk categories, those who participated in more intensive program services were significantly more likely than others to reduce their health risks. Thus, Citibank Health Management Program is associated with significant reductions in health risk. (10) Several considerations should be applied to these results: although program effects were statistically significant, they were not large in magnitude; there were inconsistent program effects associated with different follow-up intervals; and the pre-post study design is open to numerous threats to validity, including attrition and maturation. (10)

Addressing workers' compensation costs by focusing on employee health status provides an important additional strategy for health promotion programs. In a study performed by Musich, Napier and Edington the association between health risks and workers' compensation costs was investigated. This four-year study used Health Risk Appraisal, (the company's employee fitness program), data and focused on workers compensation costs among Xerox Corporation's long-term employees from 1996 through 1999. High workers' compensation costs were related to individual health risks, especially Health Age Index (a

measure of controllable risks, i.e. smoking, poor physical health, physical inactivity, and life dissatisfaction). Workers' compensation costs increased with increasing health risk status. Low risk employees had the lowest costs. In this population, 85 percent of workers' compensation costs were attributed to excess risks or non-participation in the employee fitness program. Among those with claims, a savings of \$1,238 per person per year was associated with Health Risk Appraisal participation. (14) These results indicate that health risk as quantified by a Health Age Index was positively related to worker's compensation costs. The percentage of employees with worker's compensation claims increased with increased risk status. The total workers' compensation costs (claims and absence) increased from \$2,178 per person among low risk employees to \$15,162 per person among high-risk employees. Likewise, Health Risk Appraisal participants had lower costs (\$6,506) compared with non-participants (\$9,482). (14)

A study performed in 1998 by The United States Department of Health and Human Services examined the relationship between lifestyle-related health risks and health care costs and utilization in adults. This two-year prospective study applied no intervention. It simply looked at health care utilization and costs in employees with different levels of health risks. Data were collected at a primarily white-collar worksite during 1994 and 1995. Subjects included 982 employees and spouses. The mean age was 32.1 (+/- 10.1) years. Employee medical claims obtained from a third party administrator were analyzed with respect to health care expenses and utilization. Exercise habits, stress, and overall wellness were assessed by self-report and obesity by the body mass index (BMI). Regression was used to remove outliers, and odds ratios were used to analyze the associations.

Employees who were at high risk for overall wellness (2.4 times), stress (1.9 times), and obesity (1.7 times) were more likely to have high health care costs

(>\$5,000) than subjects not at high risk. Mean total medical costs also were greater for high-risk subjects compared to lowered risk subjects. For overall wellness the difference was \$1,973, for stress the difference was 1,137, and for obesity the difference was \$1,092. Interestingly, the exercise habits measure was not significantly associated with health care costs or utilization. These results indicate that health risks, particularly obesity, stress, and general lifestyle, are significant predictors of health care costs and utilization in employed young adults. (22)

Fung, Hu, and Yu, et al in 2002 looked at the benefits of physical activity in reducing cardiovascular disease (CVD). The belief is that physical activity can mediate changes in blood lipids, insulin sensitivity, and thrombogenic factors. Few studies have addressed the effects of both long-term physical activity and inactivity on these factors. The authors assessed associations between long-term leisure-time physical activity, television watching, and biomarkers of CVD risk among 468 male health professionals. Prior to blood collection in 1993 to 1994, physical activity and television watching were assessed biennially from 1986 to 1994 by a questionnaire. Physical activity was expressed as metabolic equivalent-hours per week.

Multivariate linear regression analyses showed that metabolic equivalent-hours in 1994 were significantly associated with high-density lipoprotein cholesterol (HDL, cholesterol; positively) and with leptin and c-peptide (inversely). The average number of hours of television watching assessed in 1994 had a significantly positive association with low-density lipoprotein cholesterol and a significantly inverse association with HDL cholesterol and apolipoprotein A1. Average hours of television watching per week were also positively associated with leptin levels ( $p < .01$ ). The associations of television watching and vigorous activity with leptin and HDL cholesterol were independent of each other. These

results demonstrate that physical activity and television watching are significantly associated with several biochemical markers of obesity and CVD risk. (5)

Recent research, however, suggests that examining medical costs alone may reveal just the tip of the iceberg. A new focus, concerned with employee productivity, has emerged in health promotion research in the United States. Perhaps learning from our counterpart's abroad, the health and productivity management (HPM) movement has broadened the perspective of worksite health promotion to recognize its potential impact on worker output, disability rates, absenteeism, and employee satisfaction. Corporate health and fitness programs are becoming widely accepted as a social as well as a health benefit provided for employees. (12) The underlying assumption is that employee participation in these programs will aid in reducing absenteeism, turnover, and health care costs, as well as increase worker productivity. Once an employee joins a health and fitness program, two issues need to be addressed: 1) motivating the employee to adhere to the program initially, and 2) developing strategies that enhance the chances the employee will maintain the new exercise behavior. (13) Since prior work focusing on factors that influence participation has been inconclusive, efforts to design programs that facilitate adherence to exercise have been limited in effectiveness. As a result, the potential benefits of physical activity offered through work-site programs are not being met. (20)

A recent analysis of a Midwest manufacturer with 72,000 employees by the Integrated Benefits Institute (IBI) found that medical costs accounted for only 20 percent of the total costs of poor employee health. The other 80 percent of costs came from disability absences and lost productivity, resulting in \$1.24 billion in total health-related costs over 2.5 years (\$6,889 per employee annually). Similarly, a health and productivity benchmarking study of 43 large public and private employers found that 53% of the median annual health and productivity costs

(\$9,992 per employee annually) were for workers' compensation, turnover, absenteeism and non-occupational disability. Findings such as these have led health promotion researchers to begin quantifying the impact of worksite health beyond medical costs alone and to include measures of worker productivity.

A study by Steinhardt and Carrier examined social-environmental, physical-behavioral, and psychological factors influencing early and continued participation in physical activity. Data for the study were collected during the first six months of operation of a work-site Health and Fitness Center. Data measuring early (month one) and continued (month six) participation were obtained from printouts of frequency of employee visits. A questionnaire measured estimation of physical ability, attraction to physical activity, self-motivation, attitudinal commitment to physical activity, youth participation, social support, and convenience of the Health and Fitness Center. Fitness files were used to obtain measures of cardiovascular fitness; percent body fat and recent participation. Linear discriminate analysis was conducted to determine the practical usefulness of the social-environmental, physical-behavioral, and psychological factors for classifying employees into categories of exercise adherers and non-adherers. A measure of exercise adherence was based on company policy of six visits each month. Results for early participation (month one) indicated that convenience; sex, youth participation, attitudinal commitment, and age discriminated among adherers and non-adherers with 63 percent accuracy. At the end of six-months, attitudinal commitment, sex, convenience, and estimation of physical ability discriminated among adheres and non-adherers with 60 percent accuracy. In addition, when early participation in the health and fitness program served as a measure of recent participation for the six-month analysis, recent participation and attitudinal commitment discriminated between the two adherence categories with 75 percent accuracy. Adherers and non-

adherers were classified with 66 percent and 85 percent accuracy, respectively.

(20)

Unfortunately, data concerning the impact of comprehensive employee health programs on many measures of employee productivity is limited. While evidence clearly shows an impact of these programs on risk reduction and medical cost savings, research concerning their impact on worker performance is not as complete. (6) However, when attempting to ascertain the impact of such programs on job performance one factor holds true. Without employee adherence to program participation, the rest of the discussion is mute. The purpose of this study was to profile employee participation in employer sponsored health programs across the state of Maine.

## *Chapter 3*

### **METHODOLOGY**

#### **A. INTRODUCTION**

Health promotion and disease management programs have expanded in size and scope in both large and small worksites. Previous research has shown that despite the benefits, participation and adherence by employees in such programs have been unsatisfactory. With this in mind, the purpose of this study was to profile employer based fitness/wellness programs in the state of Maine including worksites which: (1) provide a fitness facility on site; (2) worksites which provide a discount to off site facilities, and (3) worksites which provide no financial support. Government groups and private sector employees were studied for their exercise habits away from the jobsite.

#### **B. RESEARCH DESIGN**

A survey was designed and distributed to employers throughout the state of Maine who had agreed to be part of an infrastructure grant provided by the Maine Cardiovascular Health Program. This program is being implemented at sixteen pilot worksites due to the high rate of cardiovascular disease in the state. Physical activity, nutrition, and smoking habits were assessed by this initial program survey. A coordinator was chosen at each program site and the surveys were given to employees for completion on a voluntary basis. The surveys were returned to an unmonitored area at each respective worksite in order to provide anonymity for the employees.

From the group of sixteen sites involved with the Maine Cardiovascular Health Program, thirteen agreed to be part of this causal comparative design

study. This study specifically looked at the five questions in the initial program survey pertaining to employee physical activity. These questions covered the employee's physical activity level while on the job, the length of the employee's average work day, the number of days each week the employee participates in physical activity beyond his/her job, and whether or not the employer provides opportunities, (beyond the job), for physical activity (i.e. on-site or off-site employee fitness facility). The data was specifically examined to determine differences (if any) between government worksites (city, educational institutions, and state agency's) and those in the private sector (hospital, bank, retail, factory, and manufacturing).

### **C. SUBJECTS**

Subjects were employees of either government or private sector organizations participating in an infrastructure grant provided by the Maine Cardiovascular Health Program. Of the sixteen different sites involved with this program, thirteen agreed to be part of this study. Six (45 percent) of these 13 sites were government groups and seven (55 percent) were private companies. The total possible employee population for this study was 5,193. The final number of employees answering the voluntary questionnaire was 1,467 (28 percent). Of those respondents, 52 percent were female and 48 percent were male. The average age of those completing the survey was 42 years.

### **D. PROCEDURES**

Each employee was asked to fill out a survey (see Table 1) presented to him or her at the job site by the Maine Cardiovascular Health Program. Each employer provided a place for employees to deposit their completed surveys in an anonymous manner. The completed surveys were returned to the project director of the Maine Cardiovascular Health Program void of any employee

names. For the purpose of this study, the Maine Cardiovascular Health Program provided the physical activity related data from the survey. Even the names of the 13 participating organizations were kept from this study's investigators. They were identified only as private or government employers. No risk of identification existed for those completing the survey. Furthermore, participation in this study did not hinder or advance the employer's opportunity to acquire more funding for further worksite health promotions from the Maine Cardiovascular Health Program.

The Maine Cardiovascular Health Program was implemented secondary to the high rates of cardiovascular disease in the state of Maine. Worksites throughout the state were chosen to participate in a pilot study program involving areas in which a high incidence of cardiovascular disease existed. A survey was conducted among the sites via the Maine Cardiovascular Health Program. Beth Philp, an epidemiologist formerly with the Maine Center for Public Health, and Andrew Spaulding, Worksite Coordinator, Center for Disease Control developed the survey. A majority of the questions were adapted from Center for Disease Control's (CDC) Behavioral Risk Factor Surveillance Survey (BRFSS), while others were adapted from the New York Heart Check, which is an organizational assessment of programs, benefits, activities, policies, and environmental supports. Beth and Andrew tailored the survey so as to gather some employer support, and finally, some input that would be helpful to the wellness teams in developing a plan for intervention. They then ran the survey up against Andrews Worksite Advisory Board to make sure they met the advisory's needs and the Bureau of Health's needs (they wanted it brief). Unfortunately the survey had not been validated or tested for reliability. Pilot sites were chosen by the following criteria; 1) Must have at least one pilot site in the counties with highest cardiovascular disease death rates (2000 data), Aroostook, Penobscot, Washington, Franklin, Somerset, and Oxford. 2) Heart Check Scores (Heart Check gives a score for

Organizational Readiness and Organization need) See Appendix B. 3) Subjective assessment rating (this included interviewer ratings of physical environment, wellness team and/or coordinator, and management support.

Table 1: Physical Activity Questions

1. When you are at work, which of the following best describes what you do?  
a) Mostly standing    b) Mostly Walking    c) Mostly heavy labor/physically demanding work
2. In an average week, how many days do you participate in physical activities that cause increases in breathing or heart rate?  
a) Never    b) 1 day    c) 2 days    d) 3 days    e) 4 days    f) 5 days or more
3. On the days you participate in physical activities, how much time do you spend being physically active?  
a) Less than 10 minutes    b) At least 10 minutes    c) At least 20 minutes  
d) At least 30 minutes    e) More than 30 minutes
4. Which of the following best describes your physical activity level?  
a) Not physically active on a regular basis now and do not intend to start  
b) Not physically active on a regular basis now but am thinking of starting  
c) Trying to become physically active    d) Physically active infrequently  
e) Physically active less than 5 times/week for 1-6 months  
f) Physically active 5 or more times/week for 7 months or more
5. My employer provides opportunities for me to be physically active  
a) Strongly disagree    b) Disagree    c) Somewhat agree    d) Agree    e) Strongly agree
6. What is the best way for the worksite to help employees to be physically active
7. What barriers if any would prevent you from participating in some type of physical activity?

## **E. STATISTICAL ANALYSIS**

Employer based physical activity programs were profiled using descriptive statistics. Comparisons were made between government and private organizations using Chi Square Tests for independence.

## *Chapter 4*

### **RESULTS**

Health promotion and disease management programs have expanded in size and scope in both large and small worksites. Previous research has shown that despite the known health benefits of participation in such programs, adherence by employees has been unsatisfactory. With this in mind, the purpose of this study was to profile employer based health promotion programs in the state of Maine including those which provide a fitness facility for employees on the jobsite, those which provide a discounted membership to an off-site facility for employees and those which provide no form of financial support for employee fitness. Both government and private sector worksites were studied.

Thirteen employers from across the state of Maine with a total population of 5,193 employees participated in this study. Six (45 percent) of these employers were from the public sector and seven (55 percent) represented private business. A total of 1,467 employees (28 percent) voluntarily completed the survey asking them about the frequency, duration and history of their physical activity outside of the workplace.

The first physical activity question asked employees to categorize their activity while at work. The purpose was to determine if their job primarily involves very little activity (sitting / standing in place), moderate activity (walking) or heavy exertion (heavy labor). Over 70 percent responded that the performance of their jobs involved mostly sitting, while approximately 12 percent identified heavy labor with their work. The results of question one are presented in Table 2.

**Table 2: Jobsite Activity Level**

	<b>Number of Employees</b>	<b>Percent</b>
<b>Sitting-standing</b>	1020	70.5
<b>Walking</b>	248	17.1
<b>Heavy Labor</b>	179	12.4

Question number two dealt with the frequency (days/week) the employee engages in a physical activity outside of the workplace eliciting an increase in heart rate and breathing. The results for those who answered "never" through those who felt they were active 5 or more days a week are presented in Table 3.

**Table 3: Physical Activity Frequency (Days/Week)**

	<b>Number of Employees</b>	<b>Percent</b>
<b>Never</b>	131	9.0
<b>1 day</b>	168	11.5
<b>2 days</b>	270	18.5
<b>3 days</b>	335	22.9
<b>4 days</b>	200	13.7
<b>5+ days</b>	356	24.4

On the days they participate in physical activities, employees were asked to quantify its duration (minutes). The choices were in 10-minute intervals beginning with less than 10 minutes and extending to more than 30 minutes. These results are presented in Table 4.

**Table 4: Physical Activity Duration (Minutes)**

	<b>Number of Employees</b>	<b>Percent</b>
<b>Less 10 min.</b>	126	8.9
<b>At least 10 min.</b>	147	10.3
<b>At least 20 min.</b>	280	19.7
<b>At least 30 min.</b>	290	20.4
<b>More than 30 min.</b>	579	40.7

Employees were asked about their history of physical activity; ranging from having no intention of exercising (2.1 percent of those who responded) to having exercised regularly for more than seven months (23.3 percent of those who responded). The breakdown of these results is presented in Table 5.

**Table 5: Physical Activity History**

	<b>Number of Employees</b>	<b>Percent</b>
<b>No Intent</b>	30	2.1
<b>Thinking about start</b>	190	13.1
<b>Trying to start</b>	349	24.1
<b>Less than 5 days</b>	382	26.4
<b>5 + days, 1-6 month</b>	160	11.0
<b>5 + days, 7+ month</b>	337	23.3

On a Likert scale ranging from "strongly disagree" to "strongly agree", employees were asked if their employer provided opportunities for them to be physically active. 15.3 percent of the employees strongly disagreed, 30.0 percent

somewhat agreed and only 9.5 percent strongly agreed. Table 6 contains the complete breakdown of answers to this question.

**Table 6: Physical Activity Opportunity Provided by Employer**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly disagree</b>	213	15.3
<b>Disagree</b>	304	21.8
<b>Somewhat agree</b>	418	30.0
<b>Agree</b>	328	23.5
<b>Strongly agree</b>	132	9.5

The level of financial support given by employers towards their employees' fitness was classified in three ways: 1) Free access to a company fitness facility at the work site (full support). 2) A company supported discounted membership to a fitness facility not connected with the company (partial support). 3) No financial support from the employer for pursuing a personal fitness regime. The results for this question are presented in Table 7.

**Table 7: Financial Support for Physical Activity**

	<b>Number of Employees</b>	<b>Percent</b>
<b>No Support</b>	130	8.9
<b>Partial Support</b>	1195	81.5
<b>Full Support</b>	142	9.7

Inferential statistics, specifically chi square tests for independence, were applied to determine if there were any differences between the employee responses we collected and what would be predicted. There was a significant ( $p < .001$ ) difference between reported and predicted values in the physical activity level of employees while performing their jobs. Eighty one percent of those in government positions said they sat while working. This compared to 61.5 percent in the private sector. For the performance of heavy labor, 4.8 percent and 18.6 percent qualified their work as such in the government and private sectors respectively. Complete comparisons are presented in Table 8.

**Table 8: Jobsite Activity: Government vs. Private Sector**

	<b>Government</b>		<b>Private</b>	
	<b>Number of Employees</b>	<b>Percent</b>	<b>Number of Employees</b>	<b>Percent</b>
<b>Sitting- Standing</b>	531	81.4	489	61.5
<b>Walking</b>	90	13.8	158	19.9
<b>Heavy Labor</b>	31	4.8	148	18.6

(df = 2; Chi Sq. = 83.53; p = .0000)

Table 9 compares the number of days each week government and private sector employees participate in physical activities outside of work. Employees were asked in an average week, how many days do you participate in physical activities that cause an increase in breathing and heart rate? Approximately 6 percent of government employee's said this never happens compared to 10.9 percent in private sector jobs. The number of employees on the other end of the scale (exercising five or more times a week) was also lower for government workers (23.6%) compared to their private counterparts (25%). These reported values were significantly different ( $p < .05$ ) from expected values.

**Table 9: Physical Activity Frequency: Government vs. Private Sector**

	<b>Government</b>		<b>Private</b>	
	<b>Number of Employees</b>	<b>Percent</b>	<b>Number of Employees</b>	<b>Percent</b>
<b>Never</b>	44	6.7	87	10.9
<b>1 day</b>	74	11.2	94	11.8
<b>2 days</b>	120	18.2	150	18.8
<b>3 days</b>	164	24.8	171	21.4
<b>4 days</b>	103	15.6	97	12.1
<b>5+ days</b>	156	23.6	200	25.0

(df = 5; Chi Sq. = 12.66; p = .0268)

The duration of time (minutes per day) involved with physical activity was also significantly different (p, .001). The greatest reported percentage in each group, (42.8 percent in the government, 39 percent in the private sector), were those who exercise for more than 30 minutes when they do exercise. These results are presented in Table 10.

**Table 10: Physical Activity Duration: Government vs. Private Sector**

	<b>Government</b>		<b>Private</b>	
	<b>Number of Employees</b>	<b>Percent</b>	<b>Number of Employees</b>	<b>Percent</b>
<b>Less 10 minutes</b>	46	7.1	80	10.3
<b>At least 10 minutes</b>	49	7.6	98	12.6
<b>At least 20 minutes</b>	121	18.7	159	20.5
<b>At least 30 minutes</b>	154	23.8	136	17.5
<b>More than 30 minutes</b>	277	42.8	302	39.0

(df = 4; Chi Sq. = 21.51; p = .0003)

The length of time (days, months) that employees have been engaged in physical activity outside of the workplace was also questioned. Again, there was a significant difference between predicted outcomes and our results. A very small percentage, (1.4 percent government, 2.7 percent private), reported having no intention of even beginning an exercise program. Complete comparisons can be found in Table 11.

**Table 11: Physical Activity History: Government vs. Private Sector**

	Government		Private	
	Number of Employees	Percent	Number of Employees	Percent
No intent	9	1.4	21	2.7
Thinking about starting	73	11.1	117	14.8
Trying to start	154	23.4	195	24.7
Less than 5 days	188	28.6	194	24.5
5+ days, 1-6 months	72	11.0	88	11.1
5+ days, 7+ months	161	24.5	176	22.3

(df = 5; Chi Sq. = 9.85; p = .0795)

The level of financial support provided by employers to employees for their participation in a regular exercise regime was compared between groups. When expressed as a percentage of the subject population, both groups were roughly evenly divided with 30-40 percent reporting in each category (no support, partial support, and full support). No statistical difference was noted. Table 12 contains these results.

**Table 12: Financial Support for Physical Activity: Government vs. Private Sector**

	Government		Private	
	Number of Employees	Percent	Number of Employees	Percent
<b>No Support</b>	250	39.6	267	35.0
<b>Partial Support</b>	189	29.9	229	30.0
<b>Full Support</b>	193	30.5	267	35.0

(df = 2; Chi Sq. = 4.042; p = .1337)

Comparisons were also made regarding the physical activity on the jobsite of all the employees surveyed and their frequency of exercise away from work, its duration, how long they have been engaged in an exercise regime away from work and how much support is provided by their employer for their pursuit of a personal exercise program. Our results show that regardless of their job requirements, the majority of workers perform some sort of exercise on their own, and the majority of these exercise three or more days each week. These results were significant and are provided in Table 13.

**Table 13: Jobsite Activity Level vs. Physical Activity Frequency**

	Sitting/Standing		Walking		Heavy Labor	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Never</b>	102	10	22	8.9	4	2.2
<b>1-2 Days</b>	333	32.8	64	25.8	39	22.0
<b>3-4 Days</b>	371	36.5	92	37.1	62	34.8
<b>5+ Days</b>	210	20.7	70	28.2	73	41.0

(df = 10; Chi Sq. = 48.82; p=.0000)

Our results were also significant ( $p < .05$ ) when comparing the duration (minutes per day) of physical activity outside of the workplace to jobsite activity levels. The highest number of those who sit at work also spent the longest time (>30 minutes) exercising. This was also true for those who reported their job requiring heavy labor. These results are presented in Table 14.

**Table 14: Jobsite Activity Level vs. Physical Activity Duration**

	Sitting/Standing		Walking		Heavy Labor	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Less 10 minutes</b>	99	10	16	6.6	8	4.5
<b>At Least 10 minutes</b>	106	10.7	19	7.8	22	12.5
<b>At Least 20 Minutes</b>	198	20.1	50	20.6	29	16.5
<b>At Least 30 Minutes</b>	207	21.0	50	20.6	29	16.5
<b>More than 30 Minutes</b>	377	38.2	108	44.4	88	50

(df = 8; Chi Sq. = 17.77;  $p = .0230$ )

Table 14 presents the results of comparing the employees' jobsite activity level and their current exercise history outside of the workplace. These results were significant ( $p, .001$ ). Regardless of their level of activity at work, a very small percentage reported having absolutely no intention of even beginning an exercise program. The heavy labor group had contained the smallest number, but had the highest percentage of people who had been exercising on their own for more than 7 months. Complete results are presented in Table 15.

**Table 15: Jobsite Activity Level vs. Physical Activity History**

	Sitting/Standing		Walking		Heavy Labor	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>No Intent</b>	19	1.9	7	2.9	3	1.7
<b>Thinking About Starting</b>	153	15.1	21	8.6	14	8.1
<b>Trying to Start</b>	264	26.1	52	21.3	30	17.3
<b>Less than 5 Minutes</b>	289	28.5	57	23.4	32	18.5
<b>5+ days, 1-6 months</b>	90	8.9	34	13.9	32	18.5
<b>5+ days, 7+ month</b>	198	19.5	73	29.9	62	35.8

(df = 10; Chi Sq. = 60.89; p = .0000)

The employees' jobsite activity level and whether or not they believed their employer provides them with opportunities to pursue a personal exercise program was compared. In the group who sits at work, the majority (43 percent) believed that no opportunities were provided. Those whose job involves walking were more evenly split in their opinion, and the majority of the heavy laborers (57.5 percent) believed that employer based opportunities for a personal exercise program existed. Results of this comparison were significant (p, .001) and are presented in Table 16.

**Table 16: Jobsite Activity Level vs. Physical Activity Opportunity Provide by Employer**

	Sitting Standing		Walking		Heavy Labor	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Disagree</b>	421	43.3	63	26.3	28	16.8
<b>Somewhat Agree</b>	286	29.4	85	35.4	43	25.7
<b>Agree</b>	266	27.3	92	38.3	96	57.5

(df = 4; Chi Sq. = 81.66; p = .0000)

The final comparison made was between the jobsite activity level of employees and the level of financial support given them by the employer for the

pursuit of a personal exercise program. The highest percentage of employees in each group believed their employers offered partial support for their personal exercise programs. No employer support was the lowest reported percentage in each group. These results were significant ( $p, .001$ ) and can be found in Table 17.

**Table 17: Jobsite Activity Level vs. Financial Support**

	Sitting/Standing		Walking		Heavy Labor	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>No Support</b>	120	11.8	7	3.0	2	1.1
<b>Partial Support</b>	798	78.2	213	85.8	167	93.3
<b>Full Support</b>	102	10.0	28	11.2	10	5.6

( $df = 4$ ; Chi Sq. = 40.68;  $p = .0000$ )

## *Chapter 5*

### **DISCUSSION**

The proportion of worksites offering health promotion programs to employees has increased over time. The most apparent benefits of such programs are the lower health care and insurance costs, decrease absenteeism, and improved job performance and productivity. (2, 6, 8, 9, 18, 21) A review of literature also documents improvement in job attitude and overall moral amongst participants. (3, 12, 13, 14, 15, 16, 19, 20) In many respects, worksites are opportune settings for delivering health risk factor interventions. They provide ready access to worksite populations, the opportunity for promoting environmental supports for behavior change and natural structures for social support. Recent changes and current trends in health care, (usually dictated by third party payers), are motivating employers to change how they present employee benefits. Some of these changes include providing opportunities for employees to take preventive measures towards disease such as participating in health promotion programs. The purpose of this study was to profile employer based fitness/wellness programs involving both government and private sectors in the state of Maine. A second and larger purpose was to profile the extent to which workers participate in personal exercise regimes during their leisure time. Comparisons were made between employers, who provide a fitness facility on site, provide a discount to off site facilities or provide no financial support at all. Differences between actual and predicted employee participation rates were sought in government and private sector employees. Differences between the levels of physical activity required on the jobsite were examined as well.

When taken as a whole, the vast majority of employees reported that their jobs were dominated by sitting (70.5 percent). The smallest percentage reported being involved in heavy labor (12.4 percent) (Table 2). This trend held up when the employees were divided by type of employer with 81.4 percent of government employees describing their jobs as sitting, and 61.5 percent of those in the private sector reporting the same. The smallest percentage involved in heavy labor also held up when comparing government employees to their private sector counterparts with a resulting 4.8 percent and 18.6 percent respectively. These findings are to be expected and were significantly different ( $p < .05$ ) (Table 8). The job market is continually moving away from labor-intensive tasks. With the continued growth and reliance on computers and machines in general, workers, on-the-job, are becoming more sedentary. These low activity level jobs seem to dominate the government sector in particular. With the modern day electronic transfer of information, there is little reason for employees to leave their desks.

It has been long established that in order to help prevent cardiovascular disease an individual must elevate his/her heart rate to an appropriate level (exercise) a minimum of three days a week for at least 20 continuous minutes. Our reporting methods did not allow us to establish data on these combined frequency and duration variables. We did, however, collect information on these variables separately (Tables 3 & 4). Sixty one percent of all employees reported exercising outside of the workplace three or more days per week, and 80.8 percent said they sustained their activity for more than 20 minutes. Only nine percent stated that they never engage in exercise on their own. Again, this pattern was maintained when comparing government and private sector workers. In the government group, 64 percent said they exercise 3 or more days each week while 58.5 percent of the private sector group reported the same frequency. Eighty five percent of the government employees said they held their exercise for more than 20 minutes compared to 75.5 percent of the private sector employees.

6.7 percent and 10.9 percent respectively, reported never exercising on their own. These percentages were significantly different ( $p < .05$ ) from Chi Square predicted values (Tables 9 & 10). Why this difference exists cannot be determined from the data. It does not appear to be dependant on the level of financial support received from employers for the pursuit of personal fitness. When this comparison is made, the two groups appear quite similar and there is no significance between reported and predicted values (Table 12). Perhaps the government employees conform to a stricter 40-hour workweek than do their private sector counterparts. If those in the private sector do indeed average more than 40 hours a week at work, perhaps they are less inclined to exercise on their own given their fewer leisure hours. What are interesting about these results are the low percentages in each group that reported never exercising. This contrasts sharply with other studies, which have found a sedentary lifestyle to be the norm. (7, 23)

Our high rates of reported "exercisers" are likely due to the low return rate of the survey itself (28 percent). Since the survey dealt with personal health and fitness, it seems reasonable that the returns would be dominated by those who had an interest in their personal health and take active steps towards improving it. Given the high incidence of cardiovascular disease in the population sampled for this study, we would not expect such a large percentage of self-reporting "exercisers". A less likely explanation for these numbers may lie in the environment. The state of Maine and its rural setting affords multiple outdoor recreational opportunities year 'round. An environment such as this may be more contusive to pursuing physical activity vs. a more highly populated, urban setting. A large limitation to this study, however, was the very general definition used for "physical activity". An "elevation in heart rate and breathing" leaves a lot open for interpretation by the person answering the question. Given the general population's lack of familiarity with formal exercise regimes, it is reasonable to

assume that many of those responding to this survey over-estimated their intensity of leisure time physical activity.

The frequency and duration of personal exercise in government and private employees combined was assessed in relation to their activity level while on the job (Tables 13 & 14). Of those who sit at work, 57.2 percent exercise more than three days a week and 79.9 percent perform their exercise for more than 20 minutes. In the group whose jobs entail walking, 65.3 percent reported a three-day a week minimum for their personal exercise and 85.6 percent said they exceed the 20-minute minimum for duration. The heavy laborers recorded the highest percentage (75.85 percent) of the three groups exercising on their own for 3 or more days each week. 83 percent of this group also indicated that they perform their exercises for 20 minutes or more each time. Again, our data collection did not allow for the study of combined exercise frequency and duration. An appraisal of these variables separately however, indicates that regardless of their job requirements, the majority of workers who do exercise on their own do so for at least 3 days a week, 20 minutes per day. These findings were significantly different ( $p < .05$ ) from predicted values. The employees, however, were not asked why they follow a certain frequency and duration in their exercise regime therefore it is difficult to give any conclusive reason(s) for these results. It would be nice to speculate that at some point; these individuals were made aware (educated) of the minimum exercise standards required to help in the prevention of disease. More likely, the explanation for our results lies in the reasons previously given.

The greatest frequency of personal exercise performed during leisure hours (75.8 percent) occurred in the heavy labor group, but this group also had the lowest number of subjects (179 out of the 1,467 total = 12 percent). The groups with the highest number of subjects, (those who sit at work,  $n=1020$ ) had the

lowest percentage (57.2 percent) reporting leisure time exercise of 3 or more days each week. These results are the opposite of what might be expected. However, any reasoned explanation offered from the data is beyond the scope of this research due to the limiting nature of the questions asked. The same is true when the duration (minutes/day) data are analyzed. Reported data differed significantly ( $p < .05$ ) from predicted values when comparing the physical activity performed at work to the length of time spent performing a single exercise session. The trend in each group (sitting/ walking/ heavy labor) was a very low percentage reporting they exercise less than 10 minutes at a time, with the percentage growing as the reported time spent exercising increased (Table 14). Again, these results are probably due to our low return rate of the survey, and the likelihood of a biased sample.

For the purpose of this study, there were three defined levels of employer financial support for employee fitness. These were; free access to a fitness facility on the jobsite, reimbursement for membership to an independent fitness facility and no support at all. These levels of support were labeled "Full Support", "Partial Support" and "No Support" respectively. The vast majority (81.5 percent) of employees reported they are able to receive partial support from their employers in order to pursue a personal fitness program. If we add the number reporting they receive full support the percentage grows to 91.2 percent (Table 7). These results seem unusually high. Even with the growth of employer based fitness programs nationally, it is not likely that employers in the state of Maine are ready (or able) to support employee fitness to the extent reflected in our results. When divided into government and private segments, our sample results fall more in line with the national picture. Over 60 percent of government and 65 percent of private sector employees reported partial or full financial support for their fitness programs from their employers (Table 12).

When the level of physical activity on the job (sitting, walking, heavy labor) was compared to the level of financial support received for fitness, the reported numbers were significantly different ( $p < .05$ ) from Chi Square predicted values (Table 17). The percentage of employees reporting partial and/or full support in the sitting at work, walking at work, and heavy labor at work groups was 98.2 percent, 97.0 percent and 98.9 percent respectively. All that may be said of these results is that the physical demands of the job do not seem to be related to an employer's offering financial incentives for fitness. There is, however a discrepancy in the reporting between the entire sample and when it is divided into government and private subgroups. As a whole, the sample population reports very high employer support (>90 percent), when the sample is split into government and private groups the reported percent for the same level of support drops to around 60 in both groups. What this discrepancy arises from is difficult to say, but draws the validity and reliability of the survey into question.

Our exercise related questions were only part of a larger survey implemented by the Maine Cardiovascular Health Program in an attempt to identify risk factors correlating to the high incidence of heart disease in the state of Maine. Questions regarding nutritional and smoking habits were also asked. None of the questions were original. The majority came from the Center for Disease Control's Behavioral Risk Factor Surveillance Survey (BRFSS), and a few were adapted from the New York Heart Check (NYHC). This is an instrument used by organizations to assess programs, benefits, activities, policies, and environmental supports. Both of these questionnaires have established validity and reliability. Although the instrument we used contained the same questions as the BRFSS and the NYHC, it did not undergo any attempt to establish its own validity and reliability. The lack of such testing of our instrument is one of the limitations to this study.

A second limitation to this study was the subjective manner in which the survey sites were chosen. Random selection was not used. Instead, the worksites to be surveyed were chosen using the following criteria: 1) Each of the six counties in the state with the highest incidence of cardiovascular disease had to have at least one site included in the group. 2) To be included, an organization had to have scored high on the Heart Check appraisal. This is an assessment of the worksite environment performed by the CDC to determine its organizational readiness and need for employee wellness programming (appendix B). 3) Prospective sites also were subjectively assessed by a representative from the CDC. This assessment included personal interviews of management personnel and wellness team members (if they existed). There is no way to measure the magnitude of the effect of the bias contained in the worksite selection process. But it is safe to say that bias did exist and must be acknowledged. Random selection of worksites across the state would have been a far better means of choosing participants for this study. Unfortunately, the selection process was not in the control of this investigator.

As described previously, another limitation to this study was the generalness of the language used in the survey questions; therefore self-reported measures of physical activity might not be accurate. But perhaps the largest limitation to this project was the very small return rate of the survey. Only 28 percent of the surveys were returned (1467 out of a possible 5193). Again, as discussed earlier, those who had a pre-established self-interest in exercise most likely returned surveys. Those with no such interest probably failed to see any immediate purpose in filling out and returning our survey, thus precluding any hope of acquiring a near random sample.

In conclusion, this project was undertaken in an attempt to quantify the exercise habits of workers throughout the state of Maine, as well as the level of

financial support offered by employers for such pursuit. The increasing lack of physical activity in the American population threatens to reverse the decades-long progress that has been made in reducing the morbidity and mortality associated with many chronic conditions such as cardiovascular disease. (22) Maine is no exception to this threat. Nationally, there is an ever-increasing number of employer based health promotion programs attempting to offset the financial consequences of a poorly fit work force. This study's results of Maine employers, indicates a large percentage that offer some form of financial support to employees for the pursuit of personnel fitness. Unfortunately, due primarily to a low return rate, our survey cannot be said to accurately profile the number of employees who exercise regularly because of such support, or despite the lack of it. Future research should incorporate true random selection of employers throughout the state of Maine, a more specific, valid and reliable questionnaire regarding workers' personal exercise habits and follow-up measures to insure a greater response rate.

## References

1. Abresch, B.A. (2002). A quest for excellence. *Absolute Advantage*. (May/June), 20-23.
2. Association of Quality Clubs. (1992). *The Economic Benefits of Regular Exercise*. IRSA.
3. Blair, S. (1996). *The FitWorks Savings Story*. Pacific Bell.
4. Fries, J. (1993). Two-year results of a randomized controlled Trial of a health promotion program in a retiree population, *American Journal of Medicine*. (May), 455-462.
5. Fung, T.T., Hu, F.B., Yu, J., Chu, N., Spiegelman, D., Tofler, G.H., Willett, W.C., Rimm, E.B. (2002). Leisure-time physical activity, television watching, and plasma biomarkers of obesity and cardiovascular disease risk. *American Journal of Epidemiology*. 152 (12), 1171-1178.
6. Gold, D. (2001). The rise of productivity measures in health promotion research. *American Journal of Health Promotion*.
7. Hahn, R.A., Teuesch, S.M., Rothenberg, R.B. (1998). Excess deaths from nine chronic diseases in the United States. *JAMA*. 264 (20), 2554-2559.
8. Harris J, Baxter J. (2002). From 0 to 500 in 30 Years Flat. *Absolute Advantage: Wellness Councils of America.*; 1 (8), 32-35.
9. Holzbach, R. (1993). Effect of a comprehensive health promotion program on employee attitudes. *Journal of Occupational Medicine*.
10. Martinson, B.C., O'Connor, P.j., Pronk, N.P. (2001). Physical inactivity and short-term all cause mortality in adults with chronic disease. *Archives of Internal Medicine*. 161, 1173-1180.
11. McGinnis, J.M., Foege, W.H. (1993). Actual causes of death in the United States. *JAMA*. 270 (18), 207-212.
12. Morgan, P.P., Shephard, R.J., Finucane, R., Schimmelfing, L., and Jazmaji, V. (1984). Health beliefs and exercise habits in an employee fitness programme. *Canadian Journal of Applied Sport Science*. 9, 87-93.
13. Morgan, W.P. (1977). Involvement in vigorous physical activity with special reference to adherence. In G.I. Gedvillas & M.E. Kneer (Eds.), *National College of Physical Education Association Proceedings* (pp. 163-181). Chicago Circle, IL: University of Illinois Press.
14. Musich, S., Napier, D., Edington, D.W. (2001). The association of health risks with workers' compensation costs. *Journal of Occupation Medicine*. 43, 553-541.
15. Patton, J. (1991). Worksite health promotion: An economic model. *Journal of Occupational Medicine*. (August), 868-873.
16. Penack, M. (1991). Workplace health promotion programs. *Nursing Clinics of North America*. 26 (1), 233-240.

17. Pratt, M., Macera, C.A., Wang, G. (2000). Higher direct medical costs associated with physical inactivity. *The Physician and Sportsmedicine*. 28, 63-70.
18. Rockhill, B.C., Willett, W.C., Manson, J.E., Leitzmann, M.F., Stampfer, M.J., Hunter, D.J., Colditz, G.A. (2001). Physical activity and mortality: A prospective study among women. *American Journal of Public Health*. 1 (91), 578-583.
19. Shepard, R. (1993). Employee Health and Fitness: The State of the Art (The Canadian employee fitness and lifestyle project). *Preventive Medicine*. 12, 644-653.
20. Steinhardt, M.A., Carrier, K.M., (1989). Early and continued participation in a work-site health and fitness program. *Research Quarterly for Exercise and Sport*. 60, (2), 117-126.
21. Sjoberg, H. (1983). Physical fitness and mental performance during and after work. *Ergonomics*. 23, 977-987.
22. Thompson, D. 1990. Wellness Works for Small Employers, Too. *Personnel*. (March): 26-28
23. Tucker, L.A. (2002). Differences in health care costs and utilization among adults with selected lifestyle-related risk factors. *American Journal of Health Promotion*. 16 4, 225-233.
24. United States Department of Health and Human Services Office of the Assistant Secretary for Planning and evaluation. (2002). Physical activity fundamental to preventing disease. (June)
25. United States Department of Health and Human Services. (2002) Leisure-time physical activity among adults: United States, 1997-98. W.S. Department of Health and Human Services, Centers for Disease Control and Prevention. *National Center for Health Statistics*.
26. United States Department of Health and Human Services. (1996). Physical activity and health; a report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease and Health Promotion.
27. Wellness Councils of America. (1995). Corporate leaders laud benefits of wellness. *Worksite Wellness Works*. (May).

## **Appendix A**

### **Survey**

## Health Survey

### Physical Activity

*(For questions 1-4, circle the appropriate responses)*

1. When you are at work, which of the following best describes what you do?

Mostly sitting or standing

Mostly walking

Mostly heavy labor or physically demanding work

2. In an average week, how many days do you participate in physical activities that cause increases in breathing or heart rate?

Never

1 day

2 days

3 days

4 days

5 days or more

3. On the days you participate in physical activities, how much time do you spend being physically active?

Less than 10 minutes

At least 10 minutes

At least 20 minutes

At least 30 minutes

More than 30 minutes

4. Which of the following best describes your physical activity level?

Not physically active on a regular basis now and do not intend to start

Not physically active on a regular basis now but am thinking of starting

Trying to become physically active, or am physically active infrequently

Physically active less than 5 times/week for 1-6 months

Physically active 5 or more times/week for 1-6 months

Physically active 5 or more times/week for 7 months or more

*Please circle the number that best describes your response to the statement below.*

5. My employer provides opportunities for me to be physically active.

Strongly disagree   Disagree   Somewhat Agree   Agree   Strongly Agree

## **Appendix B**

### **Heart Check**

## Heart Check

### Components:

#### 1. Organizational Demographics

- a. Is this worksite self-insured for employee health and medical benefits?
- b. In which industrial sector is this worksite located?
- c. About what percent of the workforce is unionized?
- d. As of the last payroll and not counting temporary or seasonal employees, how many employees: (work here, full-time, part-time, less than 40?)
- e. What is the average wage of employees?
- f. Which of the following shifts does this worksite have?

#### 2. Tobacco Use

- a. Does the worksite have a written smoke free work environment policy? What is the extent of the policy?
- b. Does the worksite provide any type of incentives for being a non-smoker or quitting smoking?
- c. Did this worksite provide directly or promote insurance company sponsored tobacco use treatment/smoking cessation programs/services during the previous 24 months.
- d. Does the worksite provide for the sale of tobacco products of site?
- e. Did the worksite provide anti-smoking educational messages to be general employee population during the previous 12 months as through posters, brochures, videos, or lectures?

#### 3. Nutrition

- a. Does the worksite have vending machines for employees to access food during working hours?
- b. Do your vending machines provide labels to identify “healthy” foods?

- c. In the past 12 months, have there been any special promotions or sales on healthier foods in your vending machines?
- d. Does the company have a cafeteria? (List items available daily)
- e. Do you provide labels to identify healthy foods in the cafeteria?
- f. Did the worksite provide written policies that require healthy food preparation practices in the cafeteria?
- g. Did the worksite provide any special cafeteria promotions in the last 12 months to increase the sale or consumption of “healthy foods?”
- h. Did the worksite provide directly or promote insurance company sponsored weight control programs during the previous 24 months?
- i. Did the worksite provide directly or promote insurance company sponsored “health eating” programs during the previous 24 months?
- j. Does the worksite subsidize or provide free food options for employee meetings?
- k. Did the worksite provide healthy eating messages to the general employee population during the previous 12 months such as through posters, newsletters, bulletin boards, brochures, videos, or lectures, etc.?

#### **4. Physical Activity**

- a. Does the work provide a shower and changing facility for employees who want to bike/run/walk to work or exercise during off hours?
- b. Does the worksite provide an exercise facility on-site?
- c. Does the worksite subsidize exercise facility membership off-site?

- d. Has the worksite provided or promoted insurance company sponsored fitness oriented programs for employees other than use of an exercise facility during the previous 24 months?
- e. Does the worksite sponsor sports teams or events?
- f. Has the worksite provided or subsidized fitness assessments during the previous 24 months?
- g. Does the worksite provide or maintain outdoor exercise areas or playing fields for employee use?
- h. Does the worksite have a written policy statement supporting employee physical fitness?
- i. Does the worksite provide any type of incentives for engaging in physical activity?
- j. Has the worksite provided exercise/physical fitness specific messages to the general employee population during the previous 12 months such as through posters, brochures, videos, or lectures?
- k. Does the worksite organize or sponsor a lunch time/after work-walking club?

## **5. Screening**

- a. Did the worksite provide blood pressure screening (beyond pre-employment physicals) during the previous 24 months?
- b. Did the worksite provide cholesterol screening during the previous 24 months?
- c. Did the worksite provide diabetes screening during the previous 24 months?
- d. Did the worksite provide health risk appraisal assessments during the previous 24 months?

- e. Does the worksite make blood pressure monitoring devices available for employee self-assessments?
- f. Did the worksite provide health screening educational messages to the general employee population during the previous 12 months such as through posters, brochures, videos, or lectures, etc.?
- g. Are health screenings offered on company time?
- h. Did the worksite provide depression screening during the previous 24 months?
- i. Did the worksite provide stress screening during the previous 24 months?

**6. Administrative Support**

- a. Does the worksite have a wellness committee?
- b. Does the worksite set annual organizational objectives for wellness?
- c. Does the worksite contain references to improving/maintaining employee health in the organizational mission statement?
- d. Does the worksite provide health education services to family members of employees?
- e. Does the worksite have an individual responsible for delivery of a health promotion program?
- f. What percentage of this individual's time is devoted to health promotion?
- g. Did the worksite complete a needs assessment or employee interest survey during the previous 24 months?
- h. Does the worksite maintain membership in a wellness coalition or health council?

- i. What does top management do to support employee health promotion?
- j. Did the worksite provide management-training seminars within the last 36 months on the importance of employee health promotion?
- k. Does the worksite provide flexible work scheduling policies?
- l. Does the worksite subsidize the employee's health insurance by at least 50%?

## *Biography*

It has taken many years for Wendy- Jo Berube to complete her educational dreams and goals. She could not have attained this dream without the loving support of her family. Wendy has two daughters, Tia age twenty-two, and Jessica age sixteen; she has been married to Albert J. Berube for eighteen years. When Wendy began attending classes at the University of Maine back in 1991 Jessica was only five years of age and Tia was eleven years of age.

Wendy Jo Berube was born in Millinocket, Maine on September 18, 1963. She was raised in Millinocket for two years and then moved to Connecticut (living in various areas) where she remained for the next 9 years and then returned to Millinocket where she still is today. Wendy graduated from Stearns High School, Millinocket, Maine in June of 1981 and in December 1998 she graduated from the University of Maine, Orono earning a Bachelor of Science Degree in Kinesiology and Physical Education.

Wendy is employed at Millinocket Regional Hospital as a Fitness / Wellness Specialist. She has worked in the Rehabilitation Services department for eight years, providing fitness center coverage, aquatic fitness coverage, swimming lessons for young and old, community wellness education, community fitness programs, fitness testing / evaluations, and exercise prescriptions.

She is a candidate for the Master of Science degree in Kinesiology and Physical Education from the University of Maine in May 2003.