

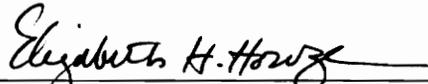
EFFECTS OF A MUNICIPAL GOVERNMENT'S WORKSITE EXERCISE  
PROGRAM ON EMPLOYEE ABSENTEEISM,  
HEALTH CARE COSTS, AND  
VARIABLES ASSOCIATED WITH PARTICIPATION

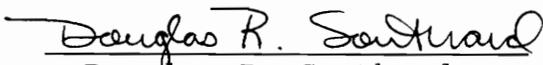
by

Angela W. Pruett

Thesis submitted to the faculty of  
Virginia Polytechnic Institute and State University  
in partial fulfillment of the requirements  
for the degree of  
Master of Science  
in  
Health Education

APPROVED:

  
Elizabeth H. Howze  
Chairperson

  
Douglas R. Southard

  
Jim C. Fortune

September, 1993

Blacksburg, Virginia

C.2

LD  
5655  
V855  
1993  
P784  
C.2

EFFECTS OF A MUNICIPAL GOVERNMENT'S WORKSITE EXERCISE  
PROGRAM ON EMPLOYEE ABSENTEEISM, HEALTH CARE COSTS,  
AND VARIABLES ASSOCIATED WITH PARTICIPATION

by

Angela W. Pruett

(ABSTRACT)

A municipal government's worksite exercise program was evaluated to determine its effect upon health care costs and employee absenteeism. Thirty-two employees who had participated for four and one-half years were compared to 32 nonparticipating employees.

Results of this evaluation indicated that participants were significantly more often female, younger, higher paid, and in higher job classifications. No significant differences in smoking status and marital status were observed between groups.

Results also revealed that participants did not use significantly fewer sick hours or health care dollars as compared to nonparticipants. However, after an initial increase in both variables the year after the program began, reductions were seen for participants in the following years. An evaluation of data prior to installation of the program showed that those joining the exercise program were not already using significantly fewer health care dollars or sick days than nonparticipants.

Focus groups conducted with nonparticipants disclosed that most employees know exercise is beneficial; however, nonparticipation was largely due to a lack of time to exercise. Findings of this research suggest that health care costs and absenteeism can be reduced over time by implementing worksite exercise programs. Worksite exercise programs need to be marketed toward older, male, lower paid workers in lower job classifications since these groups tend to not join as readily as workers who are younger, female, and higher paid.

## ACKNOWLEDGEMENTS

The author expresses her deepest appreciation to Dr. Elizabeth H. Howze for her encouragement, guidance, and suggestions throughout the course of the author's research and thesis preparation. I would also like to thank Dr. Howze for her diligent proofreading and comments which helped me become a better writer.

Much thanks is given to Dr. Jim Fortune and Dr. Douglas Southard for their advice and support during the study and throughout the writing of this manuscript.

The author greatly appreciates the Town of Blacksburg's willingness to have their worksite exercise program evaluated. In addition, special thanks to the Town of Blacksburg's Personnel Department and Finance Department for their cooperation and to the employees who participated in the study.

Appreciation is given to Mary C. Kemp, Director of Finance and all Finance Department employees for their support over the last five years.

I would like to thank my parents and mother and father in-law for their prayers, love, and encouragement.

Finally, deepest appreciation is given to my husband for his love, support, and patience through each step in writing this manuscript.

## TABLE OF CONTENTS

Acknowledgements . . . . .	iv
List of Tables . . . . .	vii
List of Figures . . . . .	ix
Chapter I	
Introduction . . . . .	1
Overview of the Worksite	
Exercise Program . . . . .	3
Evaluation of the Program . . . . .	4
Statement of the Problem . . . . .	5
Research Questions and Hypotheses . . . . .	6
Significance of the Study . . . . .	8
Limitations . . . . .	9
Summary . . . . .	10
Chapter II	
Literature Review	
Introduction . . . . .	11
History . . . . .	12
Definition of Health Education	
and Health Promotion . . . . .	12
Lifestyles and Health . . . . .	14
Reasons for Health Promotion Programs at	
the Worksite . . . . .	15
Exercise and Health . . . . .	19
What Companies Are Doing . . . . .	20
Results Companies Have Obtained . . . . .	22
Illness Absenteeism Rates . . . . .	26
Productivity . . . . .	27
Physiological Measures . . . . .	27
Employee Turnover . . . . .	28
Disability Days . . . . .	29
Health Care Costs . . . . .	29
Health Care Utilization Rates . . . . .	30
Dollar Savings Found . . . . .	31
Problems With Current Studies . . . . .	32
Who Participates in Worksite	
Exercise Programs . . . . .	34
Theory of Diffusion . . . . .	37
Summary . . . . .	42

Chapter III		
Methodology		
Setting . . . . .		45
The Worksite Exercise Program . . . . .		47
Background . . . . .		47
Components of the Program . . . . .		51
Evaluation Research . . . . .		53
Threats to Validity . . . . .		54
Consent and Confidentiality . . . . .		55
Evaluation of the Program . . . . .		56
Subject Selection . . . . .		56
Sources of Analysis Data . . . . .		57
Health Insurance Data . . . . .		57
Absenteeism Data . . . . .		58
Employee Demographics and Program		
Preferences . . . . .		60
Statistical Analysis . . . . .		60
Health Insurance Cost Analysis . . . . .		60
Employee Absenteeism Analysis . . . . .		61
Employee Demographics and Program		
Preferences Analysis . . . . .		62
Chapter IV		
Results		
Test of Hypothesis One . . . . .		64
Test of Hypothesis Two . . . . .		68
Test of Hypothesis Three . . . . .		70
Participant Questionnaires . . . . .		75
Focus Groups . . . . .		76
Chapter V		
Discussion		
Demographics and Behavioral		
Characteristics . . . . .		83
Sick Hours . . . . .		85
Health Care Costs . . . . .		87
Participant Questionnaires . . . . .		88
Focus Groups . . . . .		89
Confounding Events/Artifacts . . . . .		90
Research Implications and Recommendations . . . . .		91
Conclusion . . . . .		96
References . . . . .		98
Appendices . . . . .		103
Vita . . . . .		124

LIST OF TABLES

2.1 Reasons to Target the Worksite for Health  
Promotion Initiatives . . . . . 16

3.1 Number of Full-time Employees Working at  
the Town of Blacksburg and Number of Employees  
Joining the Worksite Exercise Program per  
Fiscal Year (Blacksburg, Virginia) . . . . . 46

3.2 Employee's Share of Monthly Health Insurance  
Premiums and Associated Percent Increase by  
Type of Coverage per Fiscal Year (Town of  
Blacksburg, Blacksburg, Virginia) . . . . . 49

3.3 Employer's Share of Monthly Health Insurance  
Premiums and Associated Percent Increase by  
Type of Coverage per Fiscal Year (Town of  
Blacksburg, Blacksburg, Virginia) . . . . . 50

4.1 Selected Demographic and Behavioral  
Characteristics of the Sample of Participants  
and Nonparticipants in the Town of Blacksburg's  
Be T.U.F.F. Program, by Number and Percent (Be  
T.U.F.F. Program, Town of Blacksburg . . . . . 66

4.2 Selected Demographic and Behavioral  
Characteristics of All Participants and  
Nonparticipants in the Town of Blacksburg's  
Be T.U.F.F. Program, by Number and Percent  
(Blacksburg, Virginia) . . . . . 67

4.3 Two-Way ANOVA With Interaction for the  
Dependent Variable Change in Sick Hours Taken  
By Participants and Nonparticipants, 1986  
Through 1992 (Town of Blacksburg, Blacksburg,  
Virginia) . . . . . 71

4.4 Two-Way ANOVA With Interaction for the  
Dependent Variable Change in Health Care  
Dollars Expended By Participants and  
Nonparticipants, 1986 Through 1992 (Town of  
Blacksburg, Blacksburg, Virginia) . . . . . 74

4.5 Questionnaire Results Obtained from Participants  
of the Town of Blacksburg's Be T.U.F.F. Program  
(Blacksburg, Virginia) . . . . . 77

4.6	Reasons Some Employees Dropped Out of the Town of Blacksburg's Be T.U.F.F. Exercise Program (Blacksburg, Virginia) . . . . .	79
4.7	Employee Recommendations to Improve to the Town of Blacksburg's Be T.U.F.F. Program Made at the Three Focus Group Sessions (Blacksburg, Virginia) . . . . .	81
5.1	Recommendations for the Town of Blacksburg's Be T.U.F.F. Program (Blacksburg, Virginia) . . . . .	93
5.2	Suggestions for the Town of Blacksburg's Be T.U.F.F. Program (Blacksburg, Virginia) . . . . .	94

LIST OF FIGURES

2.1 S-Shaped Curve . . . . . 39

4.1 Average Number of Sick Hours Used by  
Participants and Nonparticipants, Be T.U.F.F.  
Program, Town of Blacksburg . . . . . 69

4.2 Average Amount of Health Care Dollars Spent  
by Participants and Nonparticipants, Be T.U.F.F.  
Program, Town of Blacksburg . . . . . 73

## CHAPTER I

### Introduction

Today health care costs are rising faster than any other commodity in the United States. Health care is expected to reach 13% of the gross national product (GNP) this year, and, if it continues to rise at the current rate, the health sector will consume almost one-third of the GNP by 2030 (Fue, 1993).

Since employers are the largest payers of health insurance in the United States, this constantly increasing expenditure has become a top priority for them (Brennan, 1982). Many companies that once were paying all their employees' health insurance are now asking employees to help subsidize the cost.

Absenteeism is another concern of employers. If a worker does not see a doctor, but is not well enough to attend work, the employer still loses money. One company estimated it loses \$81.66 per day per absent employee (Edmonds, 1991). For a large company, employee absenteeism could easily reach into hundreds of dollars lost daily.

As one means of combating the high costs associated with health care and absenteeism, many employers have invested in worksite health promotion programs. Such

programs are designed to promote healthier lifestyles among employees in hopes of lowering employee incidence of heart disease, cancer, stroke, and injuries. These are the four leading causes of death and disability in the United States today and have all been shown to be related to our day-to-day lifestyles (Castillo-Salgado, 1984).

Inactivity is one lifestyle risk factor that significantly contributes to the aforementioned leading causes of death and disability. However, few Americans are physically active. In 1985, only 12% of people aged 18 and older engaged in vigorous physical activity three or more days per week for 20 or more minutes per occasion (Public Health Service, 1990).

More and more employers are developing worksite exercise programs, believing that a healthy employee is absent less often and uses fewer health care dollars. Health professionals are encouraging worksite exercise programs since this is an excellent way to reach a large number of individuals (Castillo-Salgado, 1984). Such programs have the potential to promote health, lower our incidence of death and disability, and decrease the nations health care expenditures. Thus, programs to promote regular exercise among individuals could be beneficial to everyone.

This research evaluates the impact of a municipal government's worksite exercise program upon absenteeism and

health care costs over a four and one-half year period. It will also compare demographics and behavioral characteristics of employees participating in the program with a group of nonparticipants and investigate the attitudes and beliefs about exercise among both groups.

#### Overview of the Worksite Exercise Program

In the fall of 1988, all employees working for the Town of Blacksburg, a municipal government in southwestern Virginia, were invited to participate in a company-wide exercise program. An employee competition was held to choose a logo and name for the program. "Be T.U.F.F." was the logo selected. This acronym stands for "Blacksburg Employees Team Up For Fitness".

Employees who joined the program were informed of the rules for participation, given a point sheet, asked to sign a consent form, and charged a \$5.00 enrollment fee which was payroll deducted. Any form of exercise could be chosen by employees (i.e., walking, biking, jogging, swimming, aerobics, etc.) as long as it allowed them to reach their target heart rate zone and maintain it for at least 20 minutes. Physical activity to be performed a minimum of three times per week, with one point awarded for each exercise session.

Program participants were required to keep a log of their exercise activity, specifically the length of exercise, date of activity, and heart rate obtained. If an employee achieved the required 36 points (3 points per week X 12 weeks) during a three month period, an established sequence of nonmonetary awards such as a T-shirt, sports bottle, hand towel, shorts, locker bag, sweatshirt, sweatpants, 1/2 day vacation, or United States savings bond was awarded. Awards were distributed at quarterly luncheons and the names of award winners were listed in the quarterly employee newsletter.

#### Evaluation of the Program

To determine the effectiveness of the Town of Blacksburg's worksite exercise program, employee absenteeism records and health care costs for the last seven years were evaluated. Yearly payroll computer printouts were used to determine if participants took significantly fewer sick days than nonparticipants.

Blue Cross/Blue Shield of Virginia (BC/BS) was the company's health insurance provider for the entire evaluation period. Their yearly reports of employee health insurance usage were used to determine if participants consumed significantly fewer health care dollars than nonparticipants.

It has been speculated that employees who participate in worksite exercise programs are already committed to improving their health and use fewer health care dollars and sick days (Davis, Jackson, Kronenfeld, and Blair, 1984). To evaluate this theory, data from the year prior to installation of the program was utilized to compare participant and nonparticipant sick days taken and health care dollars used. To further ascertain if participants are different from nonparticipants, characteristics such as employee age, salary, marital status, job level, gender, and smoking status will also be compared.

The theory of diffusion is used in conjunction with this program. Diffusion theory is a useful tool in marketing and promoting the spread of messages or new ideas throughout a population and promoting maximum participation (Rogers, 1983). People will partake in a new innovation at different rates; thus, ways to enhance the adoption rate of those people who characteristically lag behind others needs to be established. The adoption rates of employees of this program were analyzed using focus groups with nonparticipants and surveys of participants.

#### Statement of the Problem

The specific problem of concern is a two-fold one. First, there is a health problem stemming from Americans

lack of exercise which results in millions of unnecessary deaths and disabilities each year. Second, there is an economic problem of rapidly increasing health care costs and absenteeism which greatly affects employers' profitability and ability to compete in the global marketplace.

The health education problem is to evaluate the effect of one company's worksite exercise program to determine (1) if it has had an impact on employee absenteeism, (2) if it has had an impact on health care claims, and (3) which elements of the program should be maintained or modified to promote continued participation and growth of the program.

#### Research Questions and Hypotheses

The following research questions and hypotheses have been formulated to evaluate the effectiveness of the Town of Blacksburg's Be T.U.F.F. worksite exercise program.

1. Are employees who participate in worksite exercise programs significantly more likely to use fewer sick days compared to nonparticipants?
2. Are employees who participate in worksite exercise programs significantly more likely to use fewer health care dollars compared to nonparticipants?
3. Are employees who already use fewer sick days significantly more likely to participate in worksite exercise programs?

4. Are employees who already use fewer health care dollars significantly more likely to participate in worksite exercise programs?
5. Are employees with higher average salaries significantly more likely to participate in worksite exercise programs?
6. Are younger employees significantly more likely to participate in a worksite exercise program than older employees?
7. Are female employees significantly more likely to participate in worksite exercise programs than male employees?
8. Are single employees significantly more likely to participate in worksite exercise programs than married employees?
9. Are employees in higher pay grades significantly more likely to participate in worksite exercise programs than lower pay employees?
10. Are employees who refrain from smoking cigarettes significantly more likely to participate in worksite exercise programs than those who smoke?

Ho<sub>1</sub> Employees participating in the worksite exercise program will exhibit approximately the same demographic and behavioral characteristics as employees not participating in the worksite exercise program.

Ho<sub>2</sub> Employees participating in the worksite exercise program will use approximately the same number of sick days as employees not participating in the worksite exercise program.

Ho<sub>3</sub> Employees participating in the worksite exercise program will use approximately the same number of health care dollars as employees not participating in the worksite exercise program.

#### Significance of the Study

It has been hypothesized that worksite exercise programs produce healthier employees, and thus, reduce absenteeism and health care costs for organizations. However, few studies exist which evaluate the effectiveness of such programs. Those that do have various limitations such as: evaluation periods were for a short amount of time (i.e. two years or less); control groups were difficult to identify or were nonexistent; various threats to validity were present; sample sizes were small; high turnover rates were present; and randomization of subjects was inadequate (Fielding, 1988).

This research adds to our knowledge about fitness programs at the worksite. It also provides the Town of

Blacksburg with information concerning their program and ways to promote and enhance continued participation of employees in the program.

### Limitations

The following limitations may affect the findings from this investigation:

1. During 1990, the Town of Blacksburg changed payroll systems; thus, an end-of-the-year list of employee absenteeism was not available for this year.
2. A BC/BS health care cost report was not produced for the year 1990, thus the amount of health care dollars used by employees for this year was not available.
3. In 1990, the Town of Blacksburg instituted an Employee Assistance Program (EAP) which has the potential to contribute to reducing health care claims and absenteeism among employees.
4. In 1991, the Town of Blacksburg created a Health Insurance Advisory committee to assist employees in filing health claims and evaluating bills which resulted in lowering the total amount of health care dollars used.

## Summary

The cost of health care is continuing to rise in the United States. Employers are feeling this impact, and many are looking to worksite exercise programs as a method to reduce their health insurance costs and employee absenteeism. Managers and health professionals are encouraging such programs since there is potential to educate a large number of individuals about exercise and to promote their involvement in regular exercise. This could lower the nation's death and disability rates and stem rising health care costs.

This study will examine the impact of a rural municipal government's established worksite exercise program on health care costs and absenteeism rates. It will also examine existing attitudes toward exercise and barriers to exercise and will make recommendations to increase program participation.

Chapter II contains a review of the pertinent literature on worksite exercise programs which will provide the framework for the hypothesis to be tested. Chapter III will describe the methodology for this study and Chapter IV will present the study's findings. Chapter V contains a discussion of the study, research implications, and recommendations for future research.

## CHAPTER II

### Literature Review

#### Introduction

During the last 15-20 years, there has been a growing interest in disease prevention and promotion of health in the United States among individuals, businesses, and the government. One reason for this interest is that epidemiological research has shown that an individual's habits and lifestyle are major contributing factors to the leading causes of death today which are heart disease, stroke, cancer and injuries (Browne, Russell, Morgan, Optenberg, & Clarke, 1984; Belloc, 1973; Castillo-Salgado, 1984).

Businesses are paying attention to the health and lifestyles of their employees for a number of reasons including a sense of responsibility for the welfare of their workers, to better control their health insurance costs and utilization rates, and to reduce employee absenteeism. The federal government has established goals and objectives for the worksite and is allocating funds to further study the effects of an individuals lifestyle on death and disability. This is a relatively new perspective for individuals, businesses, and the government.

## History

People began to become more aware of their personal health around the middle of the twentieth century when chronic diseases began to surpass communicable diseases as the leading causes of death in developed countries. This new awareness was primarily a result of vaccinations and improved environmental conditions as well as the introduction of antibiotics just before World War II (Green, 1990). Since then, accumulating research has shown that many chronic diseases can be controlled through active involvement of people in their own health care, and that patient education could bring about significant changes in health behavior and reductions in risk factors. As a consequence, health professionals began to concentrate their efforts in a new direction, toward promoting health rather than preventing disease (Green, 1990).

## Definition of Health Education and Health Promotion

Green and Kreuter (1991) defined health education as "any combination of learning experiences designed to facilitate voluntary actions conducive to health" (p. 17). They defined health promotion as "the combination of educational and environmental supports for actions and conditions of living conducive to health" (p. 4). Health education is aimed primarily at the voluntary actions people

can take, individually or collectively, as citizens looking after their own health or as decision makers looking after the health of others and for the common good of the community (Green et al., 1991).

Today, health promotion involves a mix of responsibility by the individual, families, professionals, private or governmental organizations, and local or national agencies. Our initiative for health has shifted from institutions and professionals to individuals and families. One model that illustrates this is The World Health Organization's model which states:

... health science and technology have come to a point where their contribution to the further improvement of health standards can make a real impact only if the people themselves become full partners in health promotion... an effort must be made to enable individuals and communities to play an active role in the planning and delivery of health care. To assume such a role, people need guidance and encouragement from the health care providers in ways of identifying their health problems and of finding solutions to them... World Health Organization, 1983 (cited in Green et al., 1991).

## Lifestyles and Health

In 1990, lifestyle factors contributed to 51% of all deaths in the United States (Nobbelin, 1990). Positive lifestyle factors encompass eating a low fat diet, managing stress, and practicing accident prevention and injury control. Some adverse lifestyle factors include smoking cigarettes, practicing a sedentary lifestyle, and consuming alcohol or other drugs. The four leading causes of death and disability in the United States today are all directly related to our day-to-day lifestyles, and thus are largely preventable (Wood, Olmstead, & Craig, 1989). By making positive lifestyle changes, we have the potential to decrease the number of premature or preventable deaths and disabilities experienced by Americans (Castillo-Salgado, 1984).

Lifestyle related diseases make up a large amount of the United States's total medical payments. In 1983, an analysis of medical expenditures suggests that more than half of the \$623 billion annual total spent was for treating preventable conditions and at least one-quarter of the total costs reflected an adverse personal lifestyle (Shephard, 1985). Lifestyle behaviors were estimated to account for 40-70% of all premature deaths, a third of all cases of acute disability and two-thirds of all cases of chronic disability (U. S. Department of Health, Education, and

Welfare, 1979). Belloc (1973) followed a group of 45-year-old men and concluded that a regimen of six or seven basic good health practices added nearly 11 years to their life expectancy.

### Reasons for Health Promotion at the Worksite

Lifestyle changes can be facilitated through a combination of efforts to enhance awareness, change behavior, and create environments that support good health practices. Of the three, supportive environments will probably have the greatest impact in producing lasting changes (Green et al., 1991). The workplace is a good location for supportive environments. Here an employee is in contact with potential supporters approximately eight hours a day. This is possibly more time than is spent with families and friends. The workforce is relatively stable and can easily be reached with positive lifestyle educational efforts.

Numerous groups have realized the advantages of educating employees and are targeting this group to improve the health of the adult population. Some reasons for targeting the worksite with health promotion initiatives are listed in Table 2.1

In addition to concern about employee well being, companies have other reasons for instituting health

Table 2.1

Reasons to Target the Worksite for Health Promotion  
Initiatives

---

---

1. More than one-half of the adult population in the United States are in the working population.
  2. Men and women who are employed spend nearly 30% of their waking hours there.
  3. It offers a well defined population and accessibility to large groups of people.
  4. Periodic gathering of health information on workers is readily available.
  5. Convenience and accessibility of offering a health promotion program at the worksite are incentives to the time-harried employee.
  6. Internal communication networks are already in place.
  7. Peer pressure of co-workers and work-related social relationships can promote and sustain positive lifestyle change.
  8. High risk groups are present.
  9. The population at a worksite is relatively stable.
  10. There is a potential for reaching undeserved and hard-to-reach populations.
  11. There is a potential for contributing to needed research in health promotion methods, and maintenance of behavior change.
- 
- 

Note. From "Assessing Recent Developments and Opportunities in the Promotion of Health in the American Workplace." by C. Castillo-Salgado, 1984, Social Science and Medicine, 19, p. 353. Copyright 1984 by the Pergamon Press Ltd.

promotion programs. One is to control rising health insurance premiums. Total medical care expenditures in the United States in 1960 were \$26.9 billion or 5.3% of the gross national product (GNP). By 1970, the costs had risen to \$75 billion (7.6% of the GNP) and by 1980, the costs had risen to \$247.2 billion (9.4% of the GNP) with business paying over one-half of the national health care bill (Brennan, 1982). By 1985, we were spending almost 11% of the GNP on health care (Reinhardt, 1990) and it is estimated at 13% for 1993 (Fue, 1993). Health care has escalated at a greater rate than the cost of virtually all other consumable goods and services (Chen, 1989).

Another reason some companies are instituting health promotion programs is to better control their rising disability and absenteeism rates. In a Canadian study, the average rates of absenteeism are about 5.9 days per employee-year in non-union companies, 9.6 days per employee year in union companies and 10.8 days per employee year in the public sector (Shephard, 1985). In 1976, the American Public Health Association estimated a cost of \$700 million per year to replace the 200,000 men aged 45-65 years who die or are disabled from coronary heart disease (Donoghue, 1977). That same year, a Canadian study estimated that over \$9 billion is lost annually in time and salaries of executives whose health was affected by an illness stemming

from a lack of fitness (Donoghue, 1977). Brennan, (1982) reported that accidents resulted in 245 million work-loss days and Cox, Shephard, and Carey (1981) demonstrated that the average cost of hiring and training a new employee was \$6,250 (\$4,000 for clerical level, and \$8,500 for executive level). A 22% decrease in absenteeism would amount to about one to three days per employee per year, or at \$50 per day, a direct saving of \$88,000 in a company of 1350 employees (Cox, et al., 1981). Because of inflation, all of these costs would be larger today.

Other reasons companies are initiating worksite health promotion programs are to improve employee morale, reduce turnovers, improve productivity, respond to employee demand or interest, be part of an innovative trend in health care, improve overall corporate image, and recruit premium employees (Davis et al., 1984; Shephard, 1989; Brennan, 1982).

Worksite health promotion programs can include accident prevention, CPR and first aid, alcohol/drug abuse counseling, mental health counseling, stress management, fitness and exercise, hypertension-screening and control, smoking cessation, weight control, nutrition training, and cancer risk reduction (Fielding & Breslow, 1983). One of the most popular is exercise programs.

## Exercise and Health

Exercise improves blood circulation and allows the lungs, heart, and other organs to work together more efficiently. The American Heart Association (1989) states that "exercise improves ones quality of life and sense of well being, bolsters enthusiasm and optimism, helps an individual handle stress, assists with relaxation, sleep and weight control, allows the body to make the best use of fats and sugars, and increases stamina" (p. 1).

Fitness and exercise programs can positively affect an individual's overall health status. Donoghue (1977) showed that a sedentary population has a greater number of coronary risk factors such as elevated blood pressure, serum cholesterol, triglyceride levels, and weight, when compared to those who are active. Other studies show that those who are not physically active have more sickness episodes (Shephard, 1985), use health services more frequently (Gibbs, Mulvaney, Henes, & Reed, 1985), and report more sick days (Baun, Bernacki, & Tsai, 1986).

Additional evidence suggests that regular amounts of exercise can reduce the likelihood of developing coronary heart disease (Blair et al., 1986) which is the leading cause of death in the United States today. Hatziandreu (1988) analyzed the health and economic impact of exercise in preventing coronary heart disease. He followed 1,000 men

from the time they were 35 years of age until 65 years of age and found that regular exercise resulted in 78.1 fewer coronary heart disease events.

Powell (1987) found the risk of developing coronary heart disease in a sedentary population was 1.9 times as great as in an active population. In 1985, coronary heart disease cost the United States \$110 billion and accounted for 23% of the cost of all illness (Department of Health and Human Services, 1986). More than 132 million workdays are lost annually in the United States due to heart attacks (Donoghue, 1977).

Regular exercise is increasingly being viewed by health professionals as a key behavioral ingredient in reducing the risk of illness, particularly illness associated with heart disease (Hatzian greu, 1988). It is reasonable to expect that a fitness program offered at the worksite would be a cost-effective method of addressing disease prevention, rising health care premiums, and absenteeism.

#### What Companies Are Doing

The most valuable resource a company has is its employees. Therefore, many large corporations have initiated health promotion and health education programs which concentrate on disease and accident prevention to keep individuals healthy and productive (Wood et al., 1989).

Many of these programs have aided employees in reducing or eliminating self-destructive behaviors, such as smoking or excessive alcohol consumption, and helped them initiate healthier behaviors, such as exercising regularly and making better food choices.

Some companies with such programs include New York Telephone and Telegraph which started a hypertension program in 1973; Phillips Petroleum Company which initiated an employee recreation program in the 1930s, and in 1978 developed their "Living Well" program; and Kimberly-Clark Corporation that developed a comprehensive fitness and health program. Other corporate leaders that have started health promotion or health education programs include Anheuser-Busch, AT&T, Blue Cross and Blue Shield of Indiana, Campbell Soup Company, General Mills, IBM Corporation, Johnson and Johnson, Prudential Insurance Company, Sentry Life Insurance, Xerox Corporation, Control Data Corporation, Mattel, Xerox and Weyerhaeuser Company (Fielding & Breslor, 1983). These programs have helped lay a foundation for other employers.

Exercise programs are one of the most popular and most needed of the health education efforts offered employees by employers today. In 1979, the percentage of companies with 250 or more employees with a formally organized fitness

program was 2.5%. In 1987, this percentage rose to 32.4 and the number is continuing to rise (Karch, 1987).

Components of an exercise program vary from company to company and may consist of such options as:

- providing an on-site or off-site exercise facility,
- employers managing the program or hiring a private vendor,
- providing the program free to employees or at some cost,
- allowing employees to exercise on or off company time,
- making programs available to a limited group of employees, all employees, or all employees plus immediate families,
- offering programs on a continuous basis or in intermittent modules,
- offering release-time or flex-time to employees,
- offering incentives such as nonmonetary or money awards, and
- reimbursing employees for off-site activities.

#### Results Companies Have Obtained

One of the pioneers in worksite health promotion programs is Johnson & Johnson. The mission of their "Live for Life" program is to help management focus on promoting

lifestyle changes that will contain costs the most, and how these changes can be achieved effectively and efficiently (Wilber, 1983).

The program consists of highly standardized components such as a health screening, a life-style seminar that introduces employees to the "Live for Life" program and several lifestyle improvement modules such as smoking cessation, weight control, stress management, nutrition education, fitness, and blood pressure intervention (Bly, Jones, & Richardson, 1986). Employee participation is voluntary, free of charge, and all aspects of the program are conducted on-site.

Bly et al. (1986) evaluated Johnson & Johnson's "Live for Life" program measuring health care costs and utilization variables. They found a significant difference in health care utilization after the fourth year of its existence as well as lower inpatient admissions and hospital days. Mean annual inpatient cost increases were \$43 and \$42 for the two "Live for Life" groups compared to \$76 for the comparison group. An average savings of \$245,079 per year was realized for the Johnson & Johnson companies with the program (Bly et al., 1986).

Another company with a worksite health promotion program that has been in existence for over five years is Blue Cross and Blue Shield of Indiana. This program is an on-site

health promotion program that incorporates health risk screening and education, physiological testing, and several health-related modules such as nutrition, weight reduction, smoking, and fitness. Employees can enroll in one or more areas (Gebhardt & Crump, 1990).

Gibbs et al. (1985) reported on the differences in health care costs seen over five years between participants and nonparticipants in Blue Cross and Blue Shield of Indiana's program. They found that there was not a significant difference between the two groups prior to implementation of the program. Also, it was shown that health care costs were significantly greater for participants than nonparticipants after the first six months into the program. This suggests participants were made aware of their health problems with the introduction of the program and sought medical attention. However, they found that after 4.75 years the benefit payment was 24% lower for participants when compared to nonparticipants. The analyses showed a reduction in total health care costs to be \$519.09 per participant. After subtracting the program costs of screening and risk analysis, direct intervention, and managerial prevention, a five year average savings of \$44.74 per participant was realized (Gibbs et al., 1985).

Wood et al. (1989) evaluated General Mills "TriHealthalon" program which is a voluntary self-directed

health promotion program. It focuses on improving participants' physical, mental, and social well-being by having them complete one of three optional lifestyle activities in nine categories every three months. They found no significant difference in absenteeism between the groups prior to the program and found absenteeism to be significantly less in the participant group the second year of the program. Paybacks of \$3.10 in year one and \$3.90 in year two were seen for every dollar spent on the program (Wood et al., 1989).

Results of the above three programs demonstrated that there is a payoff after a possible initial increase in costs. However, these programs employed a multi-phasic approach incorporating various health promotion areas such as hypertension, stress, weight reduction, nutrition, exercise, and smoking into one program. When evaluating this type of program it is unclear actually which area was the most successful. Most likely, each module did not contribute equally to the variables studied, and thus, cannot help justify the installation of one component such as exercise.

However, several companies have instituted worksite exercise programs only. These employers have measured such variables as: illness absenteeism rates (Baun et al., 1986; Lynch, Golaszewski, Clearie, Snow, & Vickery, 1990;

Chenoweth, 1983; Cox et al., 1981), productivity (Cox et al., 1981), physiological measures (Cox et al., 1981; Chenoweth, 1983), employee turnover (Cox et al., 1981; Shephard, 1992) disability days (Browne et al., 1984), health care costs (Shephard et al., 1983; Gibbs, et al., 1985; Baun et al., 1986) and health care utilization rates (Baun et al., 1986; Wilber, 1983; Shephard, Corey, Renzland, & Cox, 1983).

#### Illness Absenteeism Rates

Absenteeism has been shown to drop considerably after installation of a worksite exercise program. Tenneco's program provided an on-site fitness center equipped with locker rooms, showers, whirlpool, weight-lifting equipment, bicycle ergometers, racquetball/handball courts and a indoor walking/jogging track. Program participants recorded their fitness activities using computer terminals located in the fitness center. Baun et al. (1986) reported the results of this program after one year. They found a trend for exercisers to have fewer sick hours than nonexercisers with a significant difference in absenteeism between female exercisers and nonexercisers.

The Travelers' program was evaluated using data from one year before and two years after the program began. Lunch et al., (1990) reported differences between the number of

absences taken by members and nonmembers before the program began, however, it was not significant. Their evaluation also revealed a decrease in absenteeism was related to participation (Lynch et al., 1990).

Another study using volunteers from two large insurance companies found participants with high program adherence experienced a 22% reduction in absenteeism compared to nonexercisers after six months into the program (Cox et al., 1981). Prior to implementation of the program, all groups had similar absenteeism rates.

#### Productivity

Some worksite exercise programs have evaluated their productivity rates to determine if worksite exercise programs had an effect in that area. One company conducted an arbitrary assessment on each department to determine the productivity level before and after implementation of their program. They found productivity was only slightly affected (3.4%) after six months into a program (Cox et al., 1981).

#### Physiological Measures

A consistent exercise routine has been shown to positively influence various physiological measures. One large insurance company measured maximum oxygen uptake, flexibility, and body fat to aid in determining the benefits

of their worksite exercise program. Cox et al. (1981) found small gains in oxygen uptake, flexibility, and a decrease in body fat was seen in all groups but most pronounced in exercisers when comparing control and test populations after six months.

Chenoweth (1983) reported on a worksite exercise program 12 weeks after its implementation. He found statistically significant improvements in participants' body fat percentage, body weight, resting blood pressure, resting heart rate, low back flexibility, and anthropometric measurements at five body sites.

#### Employee Turnover

Turnover was investigated by Cox et al. (1981) at a large insurance company 10 months after the fitness program began and one year prior to its installation. The analyses indicated turnover rate for exercisers and nonexercisers was not significantly different prior to inception of the program. Nevertheless, after 10 months, exercisers had significantly less turnover (1.5%) than nonexercisers (15%). Shephard (1992) reported that Toronto Life Assurance Company's turnover rates for exercisers after one year was only 1.8% as compared to the company-wide average of 18%. After seven years, turnover rates were 8.1% lower among program participants.

### Disability Days

Prudential Insurance Company instituted a voluntary exercise program for well educated, sedentary white collar workers. A 20.1% reduction in the average number of disability days and a 31.7% reduction in direct disability dollar costs was found after one year (Browne et al., 1984).

### Health Care Costs

Gibbs, et al. (1985) reported that participants in a worksite exercise program tended to incur higher health care costs than nonparticipants for the six-month period after the program began. However, after 4.75 years, participants averaged 24% lower health care costs than nonparticipants (Gibbs, et al., 1985).

Browne et al. (1984) analyzed the major medical costs of employees participating in Prudential's worksite exercise program after it had been in place for five years. The results demonstrated that exercisers experienced a 45.7% reduction in major medical costs in the postentry year. Over a four-year period the medical costs rose 29.9% for exercisers, but still were 39% less than the costs for the total office population for the same four-year period.

The average medical care cost for exercisers after one year with Tenneco's fitness program found lower costs for both males and females but were not statistically

significant compared to nonexercisers. However, ambulatory health care costs for nonexercisers was significantly higher than the costs for exercisers (Baun, 1986).

#### Health Care Utilization Rates

Tenneco found health care utilization rates were higher for exercisers than nonexercisers among both males and females (41.2 vs. 39.0 for males and 28.5 vs. 22.8 for females). However, total health care costs among exercisers was lower than among nonexercisers; indicating exercisers may utilize the health care system more often but for relatively minor illnesses (Baun, 1986).

A study of two large insurance companies (one with an exercise program and the other acting as the control) indicated a decrease of body fat tended to be related to increased hospital utilization. Nevertheless, the researchers found decreased rates among both groups and concluded their findings were possibly influenced by the "Hawthorne" effect and that the company, as a whole, had experienced a rise in health consciousness (Shephard et al., 1983). Thus, benefits may be realized by instituting a program even with low participation rates.

After six months into the exercise program, another insurance company's study found high adherers were using health care less when compared with other coworkers;

however, the differences were not significant (Wilber, 1983).

#### Dollar Savings Found

Companies are finding a dollar savings due to the development of their exercise programs. Prudential's combined cost savings from absenteeism and disability days after five years was \$232.78 per participant after subtracting operational cost (Browne et al., 1984).

A study undertaken by Shephard, Corey, Renzland, and Cox (1982) revealed an average of \$84.50 total health care savings per employee per year. In 1981, a large insurance company found an estimated savings of \$83,265 per year due to the decrease in absenteeism experienced by employees who participated in their worksite exercise program (Gebhardt et al., 1990).

All the above studies eventually reported favorable results due to the implementation of their worksite exercise program. While one could conclude that such programs are beneficial for employees and employers, there are some problems with many of the evaluations, rendering their findings inconclusive.

## Problems With Current Studies

Results of published evaluations on worksite exercise programs are inconsistent. Some companies are finding significant differences in the health of their employees as a result of their worksite exercise program, others are seeing trends in a positive direction, whereas some are finding negative results.

One reason for this variation is that every program is different. There are no generally accepted criteria for what constitutes a worksite exercise program. Program components such as length and type of exercise allowed, time of day employees can exercise, cost to employees, and frequency of activity vary from program to program (Davis et al., 1984).

Also, many terms used in the studies have varying definitions. The term "sedentary lifestyle" can mean no exercise or inconsistent exercise. "Participation" can simply mean joining a program, or partaking in a set number of classes or activities.

There are also differences in the methods used to evaluate programs. Measurement, design methodology and organizational variables vary from study to study. Methodological problems such as reliance on program participants self-reports as measures of behavioral change, absence of control groups, limited participation, self-

selection of program participants, inadequate sample size, and lack of adequate follow-up can all contribute to a lack of definitive results regarding worksite exercise programs.

Another weakness in the literature is the lack of studies on blue collar and less educated employees. In addition, small companies and public organizations are not sufficiently represented in the literature on worksite exercise program evaluations.

The level of management support can also contribute to dissimilarity in evaluation results obtained by companies. If a company's program does not have management's support, many employees will be discouraged from joining, may not be allowed to leave their job during exercise sessions and those who do participate may only exercise sporadically.

Employees who have no training in health, program implementation, or evaluation are often placed in charge of worksite exercise programs. For many, this responsibility may be an additional duty added to their already busy workload. As a result, the health promotion manager is unable to allow the time required to adequately oversee a worksite exercise program, properly evaluate it, or adequately justify continuation of the program (Golaszewski, Wassel, Yen, Lynch, & Vickery, 1990).

Another problem is that many companies are starting programs but are not performing any type of cost analysis or

comparison. Hollander (1986), reported that of the 165 Fortune 500 companies with health promotion programs which she surveyed, only 15% completed any form of program cost analysis. One would expect the percentage of smaller companies doing any type of analysis to be even lower since they have even fewer available resources. Also, companies frequently perform only short term (one year or less) analysis. Yet studies have shown that it may take several years before a cost savings is seen by a company (Elias & Murphy, 1986). Thus, program evaluation needs to be ongoing to aid in determining the short-term and long-term health benefits of worksite exercise programs.

#### Who Participates in Worksite Exercise Programs

Worksite exercise programs have emerged in the past decade with goals of modifying employee health risks and reducing employee absenteeism and health care costs. Answering the question of who comes to wellness programs is a key to achieving these goals (Conrad, 1987).

Claims have been made that participants in worksite exercise programs already use fewer health services, maintain a lower turnover rate, have fewer days absent, use fewer health care dollars and are already committed to improving their health (Davis et al., 1984). Unfortunately, employees with unhealthy lifestyles typically do not join

worksite exercise programs (Conrad, 1987). If a company fitness program has a high adherence rate by its participants, but only attracts employees who are already fit, can a program evaluator conclude that the program has met its goals?

Studies have been conducted comparing various demographics of participants and nonparticipants. One study which made such comparisons revealed that both groups had similar lifestyle habits, preventive health practices, and health status profiles (Zavela, Davis, Cottrell, & Smith, 1988). Other studies have demonstrated that there was no noticeable difference in gender, income, age, education level, marital status or absenteeism between participants and nonparticipants (Conrad, 1987; Eakin, Gotay, Rademaker, & Cowell, 1988).

Still other evaluations have found differences between participants and nonparticipants. For example, participants are more likely to be white (Brill, Kohl, Rogers, Collingwood, Sterling, & Blair, 1991), female (Marvis, Stachnik, Gibson, & Stoffelmayr, 1992; Zavela et al., 1988; Sloan & Gruman, 1988), young to middle-aged rather than older (Eakin et al., 1988; Zavela et al., 1988; Marvis et al., 1992), be more educated (Marvis et al., 1992; Brill et al., 1991), eat breakfast (Marvis et al., 1992; Zavela et al., 1988), have support of their supervisor (Sloan et al.,

1988), have not been hospitalized in the last five years (Conrad, 1987), rate their health more favorably (Conrad, 1987), and work a structured 8 to 5 day (Zavela et al., 1988).

One significant difference between participants and nonparticipants consistent with all studies conducted is that nonparticipants are more likely to be cigarette smokers than participants (Zavela et al., 1988; Conrad, 1987; Sloan and Gruman, 1988; Mavis et al., 1992).

Thus, it appears that some people with adverse lifestyle habits which worksite exercise programs are trying to attract do participate. However, if participation rates are low, very few of the participants will be those most in need of such a program.

Participation rates of worksite fitness programs range from 15% to 30% for white-collar workers and 3% to 5% for the blue collar population (Gebhardt & Crump, 1990). Participation rates increase slightly when exercise facilities are offered on-site (from 20% to 40%) compared to 10% to 25% for off-site programs (Conrad, 1987).

The main factor limiting the health impact of employee fitness programs is a low employee participation rate. There remains a need for more effective methods of recruiting workers and sustaining their enthusiasm for the exercise program (Shephard, 1989).

Workplace health promotion programs should attend to their organizational work climate as well as personal health characteristics of employees in an effort to increase participation rates and program impact (Sloan et al., 1988). A 10-week program called "Know the Audience" found that blacks, younger employees, and noncollege graduates were less likely to be recruited and participate in worksite exercise programs (Brill et al., 1991). Various demographic subgroups have different health habits and morbidity and mortality experiences. The worksite needs to be aware of its target population and its greatest health needs and implement programs and marketing techniques to promote maximum participation.

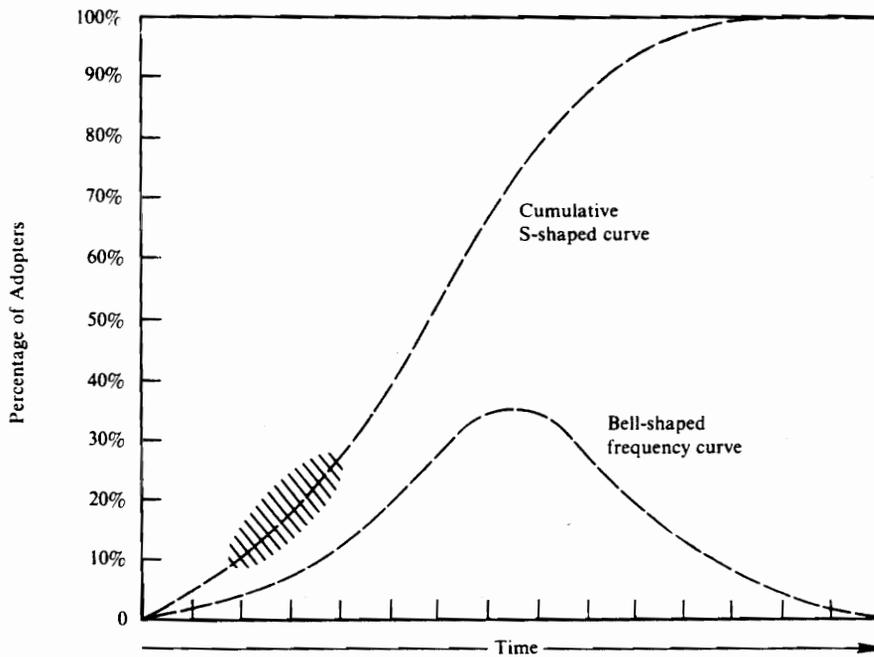
### Theory of Diffusion

The theory of diffusion is a useful tool in conceptualizing how to market the idea of exercise in the workplace and to encourage maximum participation. Diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1983, p. 5). The main elements of diffusion of new ideas are: (1) an innovation, (2) which is communicated through certain channels, (3) over time, (4) among the members of a social system (Rogers, 1983).

When applying this theory to worksite exercise programs, the innovation would be the exercise program, the communication channels are the means by which employees learn about the program and its components. Step three is the time between when employees first obtain knowledge about the worksite exercise program until they decide whether or not to participate in the program. The social system consists of all the employees working for the company.

The rate of adoption of a new program usually takes on the appearance of an S-shaped curve (Fig. 2.1). A few people will adopt the program initially, then a larger number, and eventually the curve levels off. When a person is exposed to a worksite exercise program, he or she goes through five stages before deciding to participate. These stages are (1) knowledge about the exercise program; (2) persuasion, where an attitude is formed about the exercise program; (3) decision about whether to engage in exercise; (4) implementation, where the program is tried and (5) confirmation, where the individual seeks reinforcement of their decision or decides to give it up (Rogers, 1983).

Everyone takes a different amount of time to go through the above five stages. People who are more venturesome, daring, risky, better educated, have control of substantial financial resources, are willing to accept an occasional setback, and are usually respected by others, tend to be the



Note. From "Diffusion of Innovations" by Everett M. Rogers, 1983, Third Edition. p. 243. Published by The Free press, New York, NY.

Figure 2.1  
S-Shaped Curve

people that complete the above five stages first (Rogers, 1983).

The next group to adopt a new idea are called early adopters. They are respected by their peers and play an important part in conveying information to potential joiners. Early adopters tend to have more years of education, have a higher social status, higher income, more empathy, are more rational, have a greater intelligence, have more exposure to the mass media, and have higher aspirations. Potential participants will look to early adopters for advice and information about the new idea (Rogers, 1983).

The next group, called the early majority, join just before the average member of a social system. These people usually interact frequently with their peers, but seldom hold leadership positions. They may deliberate for some time before completely adopting the new idea. They require persuasion by peers to adopt in contrast to early adopters and innovators who typically make decisions on the basis of what they learn in the media.

The late majority is next. Individuals in this group tend to adopt new ideas just after the average member of a social system. Their adoption may be due to increasing pressures. They usually do not adopt until all uncertainty about the new idea is removed (Rogers, 1983).

The group that takes the longest to adopt a new program are called laggards. They are traditional and possess almost no opinion leadership. Laggards are suspicious and make decisions in terms of what has been done by previous generations. Their poor economic position often forces these individuals to be extremely cautious in adopting an innovation since they cannot afford to be frivolous.

Diffusion theory recognizes that people will join a program at different rates. The task at hand for health educators is to find ways of enhancing the adoption rate of the middle and late majorities.

Adoption is also dependent upon the characteristics of the innovation. If the employee does not believe the program to be advantageous, easily triable, and acceptable, he or she may not participate in the exercise program. Likewise, if they have never observed anyone participating in the program they will most likely never join.

A change agent can accelerate the rate of diffusion (Kar, 1974). Rogers, 1983 explains that change agents do this by "developing a need for change on the part of potential participants, establishing an information-exchange relationship, diagnosing problems, creating intent to change in the clients, translating this intent into action, stabilizing adoption and preventing discontinuances, and then achieving a terminal relationship with the client (p. 315-317).

Diffusion can take place among companies, at which they adopt exercise programs for their employees. Another way diffusion occurs is within a company, at which employees adopt exercise. To date, adoption rates of companies implementing new worksite exercise programs and employees joining worksite exercise programs appear to be following a slowly sloping trend line characteristic of the start-up phase of the S-curve previously mentioned. Such programs may be approaching the "take-off" point of the exponential phase of the diffusion process. If this is true, we should see cumulative increases in social pressures to adopt exercise programs in the immediate years ahead, even in the absence of a change agent.

If diffusion theory is correct, people will continue to join worksite exercise programs as long a promotional and educational efforts are maintained. Eventually, those most in need of such a program will adopt the new behavior.

### Summary

We know that lifestyle affects our life span and quality of life. Negative lifestyle behaviors can be costly for the individual, the company he or she works for as well as the country. We also know that the worksite has been shown to be an effective medium for instituting health

promotion programs. Consequently, more and more worksites are implementing health promotion programs.

Exercise programs are one type of health education program companies are implementing since inactivity is a contributor to the leading causes of death today. However, due to lack of time and personnel, many companies never evaluate their programs nor keep the records necessary to conduct an evaluation. Hence, evaluations that are conducted have various limitations which limit their validity or generalizability. Thus, more worksite exercise programs need to be carefully evaluated to determine more accurately their benefits and disadvantages.

Based on this review of the literature and preliminary analysis, the following three hypothesis will be tested.

Ho<sub>1</sub> Employees participating in the worksite exercise program will exhibit approximately the same characteristics as employees not participating in the worksite exercise program.

Ho<sub>2</sub> Employees participating in the worksite exercise program will use approximately the same number of sick hours as employees not participating in the worksite exercise program.

Ho<sub>3</sub> Employees participating in the worksite exercise program will use approximately the same amount of health care dollars as employees not participating in the worksite exercise program.

The next chapter will define the specific methods and procedures employed to evaluate a municipal government's worksite exercise program which has been in existence for four and one-half years.

## CHAPTER III

### Methodology

#### Setting

The site of this research is the Town of Blacksburg, Blacksburg, Virginia. The Town of Blacksburg was incorporated in 1871 and is located in Montgomery County, Virginia in the southwest region of the state. Blacksburg has a land area of 18.8 square miles and a population of 34,590 (which includes 22,000 university students) according to the 1990 census. It is the largest town in Virginia and home of one of Virginia's two land grant universities, Virginia Polytechnic Institute and State University (Virginia Tech).

The Town of Blacksburg has been organized under the council-manager form of government since 1952. Town Council is the legislative body of the Town and is empowered by the Town Charter to make all Town policy. Town Council members, including the mayor, are elected at large for four-year overlapping terms.

The Town of Blacksburg employs approximately 200 full-time and 100 part-time employees in the following departments: Public Works, Police, Transit, Finance, Water and Sewer, Parks and Recreation, and Planning. Table 3.1 lists the number of full-time workers employed at the Town

Table 3.1

Number of Full-time Employees Working at the Town of Blacksburg and Number of Employees Joining the Worksite Exercise Program per Fiscal Year (Blacksburg, Virginia)

<u>Fiscal Year</u>	<u>Number of Full-time Employees and % Increase</u>		<u>Number of Employees Participating in Be T.U.F.F. and % Increase</u>	
1985/86	168	-	-	-
1986/87	169	(0.6%)	-	-
1987/88	174	(3.0%)	57	(32.8%)
1988/89	180	(3.4%)	65	(36.1%)
1989/90	189	(5.0%)	70	(37.0%)
1990/91	194	(2.6%)	75	(38.7%)
1991/92	194	(0.0%)	91	(46.9%)
1992/93	192	(-1.0%)	-	-

of Blacksburg over the past eight fiscal years and the number of employees that have joined the worksite exercise program each fiscal year.

Most employees of the Town of Blacksburg are white (97%) and male (66%). The average age of all male employees is 38 and all female employees is 34. Sixty-eight percent are married. Approximately 10% do not have a high school education. Fifty percent of employee households have an annual income of less than \$30,000.

#### The Worksite Exercise Program

##### Background

The Town of Blacksburg provides single coverage health insurance to all full-time employees at no cost to the employee. If the worker wishes to add a child or their family to the health insurance, the Town will pay a percentage and the employee pays a percentage of the cost.

In fiscal year 1987/1988, the Town of Blacksburg experienced a 39% increase in the cost of providing health insurance to its full-time work force and covered dependents. Fiscal year 1988/1989 saw a 47% increase and fiscal year 1989/1990 a 56% increase. The Town of Blacksburg's budget was not able to grow to meet such large increases each year. Most private enterprise companies have the option of raising the price of their goods or services;

however, being a local government, the Town could not easily raise taxes to cover its rising health insurance premiums. In addition to the large increases in premium costs, employees were becoming more and more disgruntled with their health care options, cost of coverage, and low or nonexistent yearly wage increases. Tables 3.2 & 3.3 list the dollar amounts and percent increase employees and the employer paid monthly for health insurance coverage for fiscal years 1986/1987 through 1992/93.

In an effort to curb rising health insurance premiums, upper management at the Town of Blacksburg decided to invite local hospital personnel to come on-site and conduct voluntary health profile screenings for all employees. After evaluating the results of the testing, management believed the best method to meet the need of overall employee health would be to implement an exercise program. Thus, in the spring of 1988, an on-site pilot aerobics program was initiated.

The pilot aerobics program lasted four months and was funded by the Town of Blacksburg's Personnel Department. The program was structured so that employees could work through their one-hour lunch period (they could eat while continuing to work) and then leave work an hour early to join fellow employees and exercise at the Town's Community Center. Nineteen employees participated in the pilot

Table 3.2

Employee's Share of Monthly Health Insurance Premiums and Associated Percent Increase by Type of Coverage Per Fiscal Year (Town of Blacksburg, Blacksburg, Virginia)

<u>Fiscal Year</u>	<u>Employee Only</u>	<u>Employee Plus 1 Dependent</u>		<u>Employee Plus Family</u>	
		<u>Amount</u>	<u>% Increase</u>	<u>Amount</u>	<u>% Increase</u>
1986/87	\$ 0.00	\$ 20.22	-	\$ 68.00	-
1987/88	\$ 0.00	\$ 25.83	27.7%	\$ 84.56	24.4%
1988/98	\$ 0.00	\$ 40.06	55.1%	\$118.65	40.3%
1989/90	\$ 0.00	\$ 50.07	25.0%	\$148.31	25.0%
1990/91	\$ 0.00	\$ 50.07	0.0%	\$148.31	0.0%
1991/92	\$ 0.00	\$ 50.07	0.0%	\$148.31	0.0%
1992/93	\$ 0.00	\$ 50.07	0.0%	\$148.31	0.0%

Table 3.3

Employer's Share of Monthly Health Insurance Premiums and  
 Associated Percent Increase by Type of Coverage Per  
 Fiscal Year (Town of Blacksburg, Blacksburg, Virginia)

<u>Fiscal Year</u>	<u>Employee Only</u>		<u>Employee Plus 1 Dependent</u>		<u>Employee Plus Family</u>	
	<u>Amount</u>	<u>%Increase</u>	<u>Amount</u>	<u>%Increase</u>	<u>Amount</u>	<u>%Increase</u>
1986/87	\$ 45.97	-	\$ 67.38	-	\$125.50	-
1987/88	\$ 54.58	18.7%	\$ 80.00	18.7%	\$149.00	18.7%
1988/98	\$ 83.12	52.3%	\$ 91.09	13.8%	\$162.41	9.0%
1989/90	\$131.03	57.6%	\$143.59	57.6%	\$197.14	21.4%
1990/91	\$151.22	15.4%	\$172.85	20.4%	\$244.91	24.2%
1991/92	\$165.58	9.5%	\$193.67	12.0%	\$279.92	14.3%
1992/93	\$166.58 <sup>1</sup>	0.6%	\$195.67 <sup>2</sup>	1.0%	\$313.99 <sup>2</sup>	12.2%

<sup>1</sup>Although there was a 0% increase this fiscal year, the slight difference is a result of Blue Cross/Blue Shield charging \$1.00 per employee to produce a detailed cost report for the Town of Blacksburg.

<sup>2</sup>Although there was a 0% increase this fiscal year, the differences are a result an additional option of Employee + Spouse being offered. This resulted in some employees leaving Employee Plus Family coverage and that rate increasing.

program. Interest in continuing the program was so great that management decided to expand the program by adding other types of exercise options, in addition to aerobics. More flexibility to the exercise schedule and incentives to encourage further participation were also added.

The Town of Blacksburg has experienced smaller increases in health insurance premiums over the last three years. In fiscal year 1990/91 there was a 13% increase, fiscal year 1991/92 saw a 10% increase, and fiscal year 1992/93 a 0% increase. The Town of Blacksburg covered these increases resulting in no dollar increases being passed onto employees.

#### Components of the Program

An employee committee consisting of some of the participants of the pilot program was organized to plan the program expansion. They established objectives, rules, an incentive awards structure, and a logo (Be T.U.F.F. - Blacksburg Employees Team Up For Fitness) to encourage other employees to become involved and make fitness a priority (Appendix A). Some members of this committee were designated as "site coordinators" with the responsibility of keeping records on participants at their worksite.

Upper management decided that the company would contribute \$10.00 per participant toward a monthly fee of

\$24.00 for all employees wishing to join a local fitness club. As another option, employees could pay an annual \$5.00 fee to the Town of Blacksburg and exercise on their own. Employees could participate in any type of exercise (i.e. swimming, aerobics, walking, jogging, biking) that would allow them to reach their target heart rate zone. Pamphlets explaining how to determine a target heart rate zone were given to all participants (Appendix A).

To qualify for awards, employees were to exercise in their target heart rate zone for at least three days per week, for at least 30 minutes per day. Participants earned one point per day of exercise up to 36 points per quarter. An extra incentive was offered to employees who exercised four or more days per week.

Participants were required to document their heart rates for the first quarter of exercise so they could learn to pace themselves according to their physical condition. Thereafter, employees were asked to document only the form of exercise and the length of time they exercised. These forms were remitted monthly to the participant's site coordinator and constituted the only type of record keeping on the program (Appendix A).

Incentive awards were presented at quarterly luncheons and recipients' names were listed in the quarterly employee newsletter to recognize them for their accomplishment (Appendix A).

The program also incorporates annual fitness and health screenings for all full-time employees, whether or not they were members of the Be T.U.F.F. program. Also included were spouses and children since family members account for a majority of health care claims experienced by an organization. In addition, periodic wellness sessions such as "How to Manage Stress", "How to Talk to Your Doctor", "Weight Loss and Eating Right", "Women's Health Issues", "How to Stop Smoking", and "How to Deal With Difficult People" have been offered to all employees, usually at no cost.

The Town of Blacksburg has received several awards as a result of their program. In 1990, the Be T.U.F.F. program received an Effective Government award from the Virginia Municipal League, selected from 95 entries from across the state. The Be T.U.F.F. program also played a part in the Town of Blacksburg being a finalist for a United States Senate Productivity Award for Virginia. The Town of Blacksburg is the first local government in the state of Virginia to be recognized as a finalist for this prestigious award.

#### Evaluation Research

An evaluation was conducted to determine the effectiveness of the Town of Blacksburg's worksite exercise

program. As discussed by Weiss (1972) "evaluation research measures the effects of a program against the goals it set out to accomplish as a means of contributing to subsequent decision making about the program and improving future programming" (p. 4). Evaluation research differs from other types of research in that it takes place in an action setting and it is intended for use rather than the production of knowledge.

Program evaluation is a step that is often overlooked possibly due to the perceived complexity of undertaking such a task (Weiss, 1972). However, this step is an increasingly important source of knowledge and direction especially for health education programs. Since health education programs are constantly striving to reach as many individuals as economically and as effectively as possible, program evaluation is an essential component of all worksite programs.

### Threats to Validity

This research is a quasi-experimental time series design that inherent to its design has some potential threats to internal validity. History is one threat that could possibly have an effect upon this evaluation. The Town of Blacksburg adopted an employee assistance program (EAP) in 1990 which was available to all employees. An EAP

has the potential to decrease health care cost and absenteeism. In addition, a health insurance advisory committee consisting of six employees was established in 1991 to aid all employees in evaluating their medical bills in order, to prevent payment of duplicate bills and payment for services never received. It is estimated that this committee has saved approximately \$20,000 for employees and the Town of Blacksburg since its inception (Edmonds, 1993). However, since these programs are available to participants as well as the comparison group, this threat to validity should be minimal.

Instrumentation is another possible threat to this type of design; however, the instruments of measurement were constant throughout the seven years to be evaluated.

The threat of maturation may be significant since reports on the same group of participants and controls will be used for all seven years. These individuals have grown older over the course of the study and with age comes an increased need to use health care and to be absent from work more often. However, this threat would be true for both participants and the comparison group.

#### Consent and Confidentiality

Informed consent was obtained from the Town Manager to use various reports, memos, and pamphlets produced by or for

the Town of Blacksburg (Appendix B). Individual informed consent forms were signed by all employees before participating in the focus groups (Appendix B). There were no risks to subjects participating in this evaluation since names were not associated with any comments. Any benefits employees receive by participating in this evaluation are in the form of enhancements made to the Be T.U.F.F. program.

All information used for this analysis was kept in strictest confidence and under lock and key. Various reports used were only seen by the principal investigator of this research. Employee names were not associated with any of the results obtained and reported.

#### Evaluation of the Program

Prior to evaluating the program, permission was obtained from the VPI&SU Human Subjects Committee to perform this study (Appendix B).

#### Subject Selection

All employees were initially invited to participate in the Town of Blacksburg's Be T.U.F.F. program through communications such as the employee newsletter, flyers, payroll stuffers and a memo sent to all employees. For purposes of this research, "participants" were identified as those full-time employees who have been working at the Town

of Blacksburg since 1987, who were in the exercise program for the four and one-half years being studied, and who met the program requirement of exercising three times per week for at least one quarter per year.

Nonparticipants were randomly selected from a list of full-time employees who have worked for the Town of Blacksburg since 1987 but never joined the Be T.U.F.F. program. To select the first person, a random numbers table was used. Following this, every fifth person on the list was chosen until the number of nonparticipants equaled the number of participants. This type of sampling was not intended to increase comparability but to select a representative sample of nonparticipants.

#### Sources of Analysis Data

##### Health Insurance Data

The Town of Blacksburg's health insurance carrier for the entire six years of the study was Blue Cross and Blue Shield of Virginia (BC/BS). All full-time employees were covered under this plan. Employee family members can be included for an additional fee which is payroll deducted. The plan requires a hospital admission review in which BC/BS must be notified before the individual is hospitalized.

The health care coverage pays 100% of basic hospital services. However, if care is received in a facility that

does not have a participating agreement with BC/BS, payment will be 80% of the allowable charges. Basic surgical/medical services are paid in full and major medical services pay a lifetime maximum of \$1,000,000 per family member. Major medical also has a \$100 deductible and an out-of-pocket maximum of \$500 per individual for covered services each year. Payment for outpatient psychiatric care is 80% of allowable charges.

A prescription drug card was added to the health insurance policy in 1991. The employee's cost for a generic drug is \$5.00 and the cost for a brand name drug is \$10.00.

Data from annual reports submitted by BC/BS were used to calculate the total health insurance dollars used by every employee for fiscal years ending 1987, 1988, 1989, 1991, and 1992. A 1990 report was not available since the Town of Blacksburg did not request one that year. Each report listed the name of the person receiving health care; therefore, family members were easily distinguished from employees and was not included in the totals.

#### Absenteeism Data

Full-time employees receive eight hours of sick leave and between eight and 16 hours of vacation leave each month (depending on the number of years they have been employed with the Town) to be used as needed. If these hours are not

used by the employee, they can be carried from year to year with employees accumulating a maximum of 180 sick days and 40 vacation days. Sick hours can be used in increments of 15 minutes and vacation hours in increments of one hour.

Every time work is missed, an employee must complete a leave slip which is then signed by their supervisor. The employee must indicate on the slip whether he/she was taking vacation or sick leave. However, no distinction is made as to whether the employee is taking sick time due to a personal illness, a preventive doctor visit, or an illness in their immediate family which requires the employee's attention.

Information from these slips is transferred to departmental time sheets which are then sent to the Town's payroll clerk bimonthly. The time sheets are once again checked for accuracy and then entered into the computer. An end-of-the-year payroll computer printout is generated which totals the number of sick hours each employee took that calendar year. Printouts for 1987, 1988, 1989, 1991, and 1992 were used to obtain the total number of sick hours each employee used during the year. Due to a change in payroll programs, an end-of-the-year payroll computer printout was not generated for 1990. This program change allowed for faster processing only; the measuring instrument itself was not affected.

### Employee Demographics and Program Preferences

A 1992 list of all full-time employees generated by the Town of Blacksburg's Personnel Department was used to extract such demographic data as age, job classification, marital status, and salary. To gather additional information not contained in this report, verbal question answer sessions were conducted by the principal evaluator of this research.

A survey taken by participants of the Be T.U.F.F program was used to help determine what facets of the program are most important to them and what changes could be made to enhance the program (Appendix C). Focus groups were conducted with nonparticipants to determine their beliefs concerning exercise and barriers which inhibit participation in the program (Appendix D).

### Statistical Analysis

#### Health Insurance Cost Analysis

To determine if participants in the Town's exercise program are using more health care dollars than nonparticipants, the aforementioned BC/BS reports were utilized. To ascertain if employees who joined the Be T.U.F.F. program were using less health care dollars than nonparticipants prior to joining the program, the 1987 report (the year before the program began) was used. Data

from these reports was entered into the Number Cruncher statistical software program and compared using a two-way ANOVA and a significance level of  $p \leq 0.05$ .

These insurance reports will also be used to determine if participants' health care costs have been declining since joining the program. Each participant's total health care dollars used during the year 1987 (the year before the program began) through 1992 (excluding 1990) will be compared using a dependent t-test and a significance level of  $p \leq 0.05$ .

#### Employee Absenteeism Analysis

The mean number of days a Town employee is absent due to sickness during the calendar year has been fluctuating between 7.29 and 8.71 over the past seven years. To determine if participants in the Town's exercise program were absent from work significantly less often than nonparticipants, the aforementioned end-of-the-year payroll computer printouts were used. To ascertain if employees joining the Be T.U.F.F. program were using fewer sick hours than nonparticipant prior to joining the program, the end-of-the-year payroll computer printout for 1987 (the year before the program began) were used. Data from these reports were entered into Number Cruncher statistical

software program and compared using a two-way ANOVA and a significance level of  $p \leq 0.05$ .

These end-of-the-year payroll reports were also employed to determine if participants in the program have been experiencing a decline in absenteeism since joining the program. Participants' total sick hours taken for 1987 (the year before the program began) through 1992 (excluding 1990) were compared using a paired t-test and a significance level of  $p \leq 0.05$ .

#### Employee Demographics and Program Preferences Analysis

Characteristics of participants and nonparticipants were evaluated to aid in understanding who participates in the program and if employees in most need of such a program are members. The aforementioned life insurance list of employees for the year 1992 and verbal question and answer sessions were used to determine significance of such characteristics as age, gender, marital status, job classification, salary, and smoking status. These variables were examined using chi square analysis.

To understand why the Town has been experiencing a higher participation rate its Be T.U.F.F. program compared to other companies with similar programs, surveys of participants were analyzed. These surveys aided in

understanding what aspects of the program participants like most and what would foster their continued participation. They will also reveal areas of concern and suggestions to enhance the program.

Focus groups of nonparticipants were conducted to better understand why some employees did not join the program as well as to solicit ideas that would promote their joining. Focus group questions are attached (Appendix D).

Chapter IV which follows describes the results of this study. Chapter V contains a discussion of the analysis and recommendations for program improvement and future research.

## CHAPTER IV

### Results

Three hypotheses were tested to determine what impact, if any, the Town of Blacksburg's Be T.U.F.F. program has had over the last four and one-half years. The first hypothesis compared a selected demographic and behavioral characteristics of participants and nonparticipants. The second hypothesis employed sick hours as the dependent variable and the third hypothesis tested health care dollars spent by participants and nonparticipants. In addition, questionnaires given to participants and comments from focus groups conducted with nonparticipants were evaluated. Results obtained from these separate analyses are described below.

#### Test of Hypothesis One

Ho<sub>1</sub> Employees participating in the worksite exercise program will exhibit approximately the same demographic and behavioral characteristics as employees not participating in the worksite exercise program.

An analysis of the demographic and behavioral characteristics of the sample of 32 participants and 32

nonparticipants chosen for this study (Table 4.1), showed no significant differences between groups on selected characteristics.

A second analysis using the total population was also conducted which revealed some important differences in the two groups (Table 4.2). Job classifications, for example, were significantly different ( $X^2 = 13.6373$ ,  $p = .0011$ ) for participants and nonparticipants. Participants were more apt to be supervisors in upper level job classifications while nonparticipants were more likely to be employed in lower job classifications. Employee salaries were another differentiating characteristic ( $X^2 = 17.1546$ ,  $p = .0042$ ); higher paid employees were more likely to join Be T.U.F.F. than lower paid employees. Women were more likely than men to join the program ( $X^2 = 5.8741$ ,  $p = 0.0154$ ). Neither age ( $X^2 = 13.4145$ ,  $p = 0.0984$ ) nor marital status ( $X^2 = 0.5855$ ,  $p = 0.4442$ ) were significant demographic differentiators. Although smoking rates were 5.4% lower among participants, smoking status was also not a predictor of participation ( $X^2 = .7938$ ,  $p = .3730$ ).

Table 4.1

Selected Demographic and Behavioral Characteristics of the Sample of Participants and Nonparticipants in the Town of Blacksburg's Be T.U.F.F. Program, by Number and Percent (Blacksburg, Virginia)

	Sample Participants		Sample Nonparticipants	
	N	%	N	%
Married	19	59.3	23	71.9
Female	15	46.9	9	28.1
Male	17	53.1	23	71.9
Age				
< 25	2	6.3	2	6.3
26-30	7	21.9	1	3.1
31-35	6	18.7	2	6.3
36-40	7	21.9	9	28.1
41-45	5	15.5	7	21.9
46-50	2	6.3	2	6.3
51-54	2	6.3	5	15.5
55-60	0	0.0	3	9.4
61 +	1	3.1	1	3.1
Job Class				
1-6 (Pink & Blue Collar)	13	40.6	19	59.4
7-9 (Supervisors)	15	46.9	10	31.2
10-15 (Upper Management)	4	12.5	3	9.4
Salary				
\$0 - \$20,000	10	31.2	14	43.8
\$20,001 - \$25,000	8	25.0	8	25.0
\$25,001 - \$30,000	6	18.9	4	12.5
\$30,001 - \$35,000	4	12.5	4	12.5
\$35,001 - \$40,000	1	3.1	1	3.1
\$40,000 +	3	9.3	1	3.1
Smoke Cigarettes	5	15.6	7	21.9

Table 4.2

Selected Demographic and Behavioral Characteristics of All Participants and Nonparticipants in the Town of Blacksburg's Be T.U.F.F. Program, by Number and Percent (Blacksburg, Virginia)

	All Participants		All Nonparticipants	
	N	%	N	%
Married	54	66.6	79	71.8
Female*	33	40.7	27	24.3
Male	48	59.3	84	75.7
Age				
< 25	9	11.1	16	14.6
26-30	22	27.2	14	12.7
31-35	15	18.5	13	11.8
36-40	11	13.6	22	20.0
41-45	12	14.8	15	13.6
46-50	6	7.4	9	8.2
51-54	3	3.7	13	11.8
55-60	2	2.5	7	6.4
61 +	1	1.2	1	.9
Job Class*				
1-6 (Pink & Blue Collar)	39	48.1	80	72.7
7-9 (Supervisors)	33	40.8	27	24.6
10-15 (Upper Management)	9	11.1	3	2.7
Salary*				
\$0 - \$20,000	26	32.1	60	55.0
\$20,001 - \$25,000	27	33.3	26	23.9
\$25,001 - \$30,000	10	12.4	11	10.1
\$30,001 - \$35,000	8	9.9	8	7.3
\$35,001 - \$40,000	1	1.2	3	2.8
\$40,000 +	9	11.1	1	.9
Smoke Cigarettes	16	19.8	28	25.2

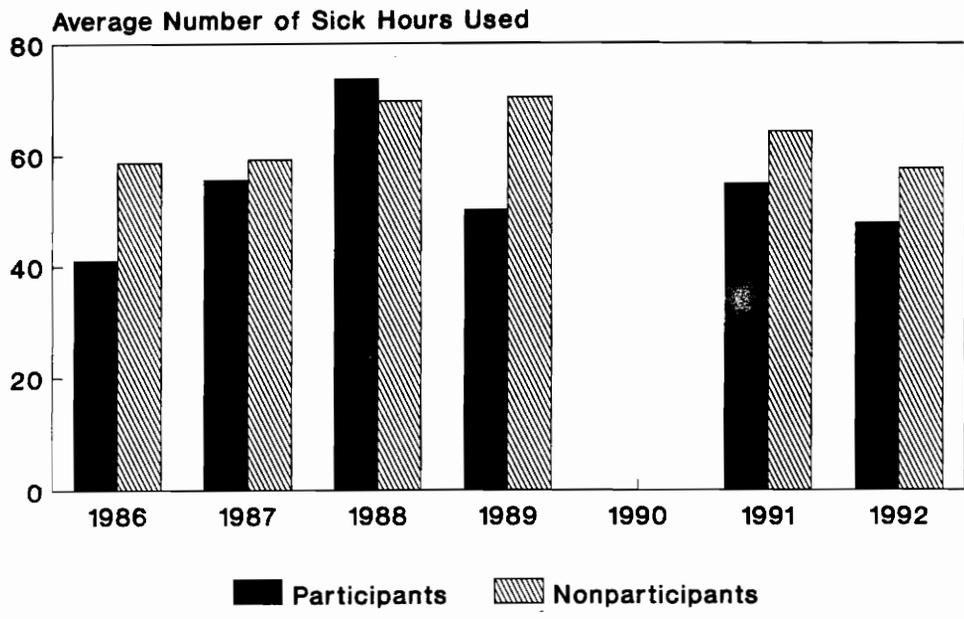
\* P ≤ .05

## Test of Hypothesis Two

Ho<sub>2</sub> Employees participating in the worksite exercise program will use approximately the same number of sick hours as employees not participating in the worksite exercise program.

Utilizing sick leave data from 1987 only (the year before the program began), an independent t-test revealed that people who joined the Be T.U.F.F. program were not using significantly fewer sick hours as compared to nonparticipants ( $T = -.3185$ ,  $p = 0.7512$ ).

In 1987, participants used an average of 3.5 fewer sick hours than nonparticipants. The year the program began (1988), participants exhibited a 24.5% increase in their number of sick hours taken. Nonparticipants experienced a 15.0% increase that same year. The first full year the program was in place (1989), participants exhibited a 31.9% decrease (from 73.72 hours to 50.22 hours) in their number of sick hours used while nonparticipants usage remained relatively stable that year (69.69 hours to 70.36 hours) (Fig. 4.1). Nonparticipant's usage has declined since 1988 reaching in 1992 approximately the same usage seen in 1986 and 1987. Figure 4.1 does not include a dollar correction for inflation.



**Figure 4.1 Average Number of Sick Hours Used By Participants and Nonparticipants Be T.U.F.F. Program, Town of Blacksburg**

A two-way ANOVA revealed there was no significant difference between participants' and nonparticipants' sick leave usage by year or participation status; however, participation did approach significance (Table 4.3). The null hypothesis is sustained.

An analysis of sick hour data for exercisers from 1987 through 1992 (excluding 1990) demonstrated that participants have not experienced a significant reduction since joining the program. However, the number of sick hours used by participants has remained relatively constant since 1989 and their usage has been consistently less than that of nonparticipants.

### Test of Hypothesis Three

Ho<sub>3</sub> Employees participating in the worksite exercise program will use approximately the same number of health care dollars as employees not participating in the worksite exercise program.

An independent t-test analysis utilizing health care dollars spent in 1987 only (the year before the program began), revealed that people who joined the Be T.U.F.F. program were not using significantly fewer health care dollars compared to nonparticipants ( $T = -.7692$ ,  $p = 0.4447$ ).

Table 4.3

Two-Way ANOVA With Interaction for the Dependent Variable  
 Change in Sick Hours Taken By Participants and  
 Nonparticipants, 1986 Through 1992 (Town of Blacksburg,  
 Blacksburg, Virginia)

---



---

Source	SS	df	MS	F	p
Participation	8433.65	1	8433.65	2.90	0.0884
Year	18359.89	5	3671.98	1.26	0.2790
Participation /Year	6368.25	5	1273.65	0.44	0.8217
ERROR	1072213.00	369	2905.73		
TOTAL	1105132.00	380			

---

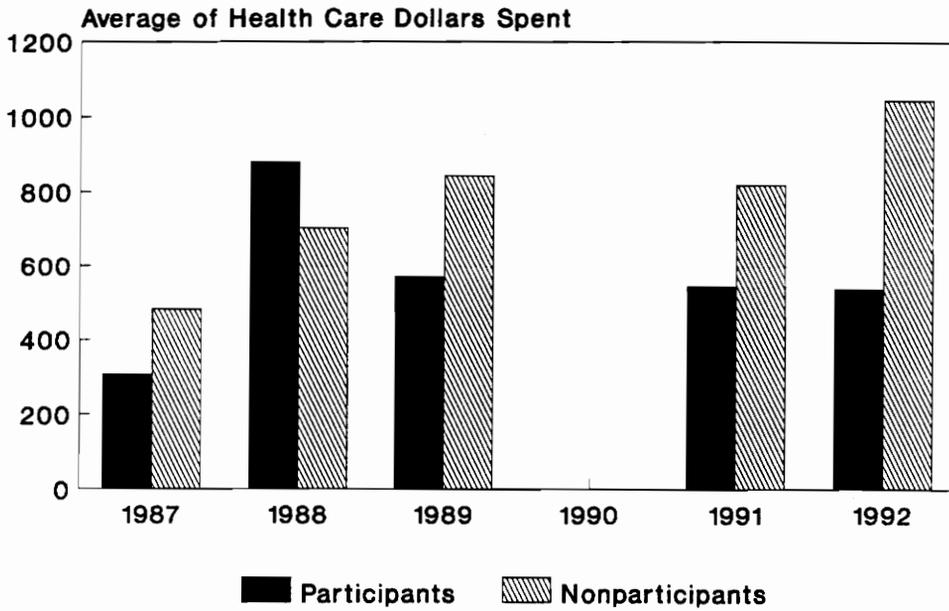


---

Level of significance .05 (two-tailed test)

In 1987, participants used an average of \$175.94 fewer health care dollars than nonparticipants. In 1988, the year the program began, participants saw a 65.0% increase in average expenditures, exceeding the expenditure of nonparticipants by an average of \$174.49. In the first full year after the program was in place (1989), participants exhibited a 35.0% decrease (from \$878.54 to \$571.34) in the average amount of health care dollars consumed while nonparticipants showed a \$139.20 increase. An analysis of consecutive years reveals the difference between health care dollars used by participants and nonparticipants was \$275.56 in 1991, and \$507.33 in 1992 (Fig. 4.2). However, a two-way ANOVA indicated there was no significant difference between the amount of health care dollars spend by participants and nonparticipants ( $F = 0.42$ ,  $p = 0.8366$ ). In addition, no significant differences between participation and year were found (Table 4.4). The null hypothesis is sustained. Figure 4.2 does not include a dollar correction for inflation.

An analysis averaging health care dollars spent by exercisers from 1987 through 1992 (excluding 1990) demonstrated that participants have not experienced a significant reduction since the beginning of the program. However, health care expenditures of participants have leveled off since 1989 increasing 42.8% since 1987, an average of 8.56% per year. Nonparticipants have shown a



**Figure 4.2 Average Amount of Health Care Dollars Spent By Participants and Nonparticipant Be T.U.F.F. Program, Town of Blacksburg**

Table 4.4

Two-Way ANOVA With Interaction for the Dependent Variable  
 Change in Health Care Dollars Expended By Participants and  
 Nonparticipants, 1986 Through 1992 (Town of Blacksburg,  
 Blacksburg, Virginia)

Source	SS	df	MS	F	p
Participation	4,175,931	1	4175931	2.23	0.1356
Year	14,588,000	5	2917685	1.56	0.1718
Participation /Year	3,913,649	5	782730	0.42	0.8366
ERROR	692,000,000	369	1875355		
TOTAL	714,690,000	380			

Level of significance .05 (two-tailed test)

clearly upward trend with a 53.7% increase since 1987, an average of 10.75% per year.

### Participant Questionnaires

Approximately 50% (n = 25) of the questionnaires distributed to participants were returned. Most employees answering the survey had met the minimum number of points (36 per quarter) every quarter since the program began.

Participants stated that the most important motivational factor prompting them to begin exercising was so they would feel better and have more energy. They reported that the most important motivational factor prompting them to continue exercising was to preserve their future personal health.

Comments concerning incentive awards were noted on the returned questionnaires. Some participants stated that incentive awards were an excellent way to promote participation initially, but became unnecessary after employees established a consistent exercise routine. More than half of the respondents indicated they would continue to participate in the program even if incentive awards were discontinued. However, the opportunity to obtain awards through participation is clearly important to participants since obtaining awards was ranked as the third reason for both beginning and continuing to exercise.

Participants answering the questionnaire recommended changes to the Be T.U.F.F. program include informing exercisers about the types of exercise others are doing and at what frequency. Exercisers also indicated that they would like to see examples of cost savings realized due to installation of the program distributed to all employees. However, most participants thought the program was valuable and suggested no changes be made. Survey question results are listed in Table 4.5.

#### Focus Groups

Three focus groups were held. One focus group was conducted with six employees who had joined the Be T.U.F.F. program at one time, but had dropped out. All employees in this group believed exercising was very important to maintaining their health and did not think they were currently exercising enough. Participants in this group stated various reasons for dropping out; they are listed in Table 4.6.

The other two focus groups held included employees who had never joined the Be T.U.F.F. program. Five male employees from the Public Works Complex participated in one group session. Seven employees (five males and three females) from various departments (Planning, Finance, Transit, Public Works Administration and Police)

Table 4.5

Questionnaire Results Obtained from Participants of the Town of Blacksburg's Be T.U.F.F. Program (Blacksburg, Virginia)

---

---

1. Since you've been in the program, how many quarters have you met the minimum number of points (36)? (possible 10 quarters)

0 quarter = 1	4 quarters = 3	8 quarters = 1
1 quarters = 3	5 quarters = 0	9 quarters = 1
2 quarters = 4	6 quarters = 1	10 quarters = 6
3 quarters = 0	7 quarters = 1	no answer = 4

2.\* According to the level you are at presently, please rank the following in the order that motivates you to exercise.

1. Makes you feel better at the present time (stress reducer)
2. Future personal health
3. Award
4. Money being paid by employee to exercise
5. Potential for reduced health care costs
6. Requirement to document

3.\* According to the level you were at when you began the program, using the same ranking procedure, please rank the following in the order that motivated you to exercise a that time.

1. Future personal health
2. Made you feel better (reduced stress, more energy)
3. Award
4. Potential to reduce health care costs
5. Requirement to document
6. Money being paid by employee to exercise

\* Responses to questions 2 and 3 were determined by assigning each factor a number, totalling them, and listing each in order of most important to most participants to least important to most participants.

4. If the awards are a strong motivator for you, how often do you think they should be given?

Annually = 1                      Bi-yearly = 1                      Quarterly = 16  
No Motivator = 1                  No Answer = 6

5. Again, if the awards are a strong motivator for you, do you see that changing in the future?

Yes = 1                      No = 15                      No Answer = 9

6. What, if any, changes would you like to see in the program?

No changes made at this time = 8  
Options to choose less awards when eligible.  
More employee involvement and more health tests/checks.  
Employer pay more of cost toward health club membership.  
Publish success stories in employee newsletter as well as what other employees are doing to keep fit.  
Have more organized luncheons.  
Stop giving awards after one year of participation.  
No Answer = 8

7. Would you continue in the program if awards were discontinued after a two-year period?

Yes = 16                      No = 4                      No Answer = 5

8. In a period of fiscal constraint, would you be willing to forego receipt of an award?

Yes = 18                      No = 3                      No Answer = 4

9. Do you have any ideas or creative cost saving measures which could be used to motivate/reward/recognize Be T.U.F.F. members for continuing their exercise program after two years?

None at this time - 2  
Lower the cost of awards  
Lower rates  
Recognition  
Encourage different forms of exercise and provide some inspirational ideas for exercising  
Continue to offer vacation days as award  
No Answer - 14

Table 4.6

Reasons Some Employees Dropped Out of the Town of  
Blacksburg's Be T.U.F.F. Exercise Program (Blacksburg,  
Virginia)

---

---

- Had surgery and never started back.
  - Did not like completing the required paperwork.
  - Too busy.
  - Didn't feel they had support from their supervisor.
  - Felt guilty leaving work to exercise.
  - Exercising after work took time away from their families.
  - Kept putting exercise off until the next Be T.U.F.F. quarter started and then something would come up and exercise would be put off again until the next quarter which resulted in a continuing cycle of not initiating exercise.
  - Lack of support and information from site coordinator.
  - Did not feel like part of a group or that they had any support.
  - The program cost too much.
- 
-

participated in the last group. All participants of both groups stated they believed exercise was beneficial to their health. Some stated they did not get enough exercise whereas others said they owned farms and felt they obtained enough exercise performing farm work after hours. In addition, others felt their jobs at the Town of Blacksburg provided them with enough physical exercise and believed they should be given Be T.U.F.F. credit and earn incentive awards for that work.

Some participants of these focus groups stated they had never joined the program because attempting to participate during their brief lunch break was too hectic and personal life demands prevented them from exercising after work. Some described themselves as just lazy, while others said they had farm work to do in the evenings and thus did not have time to participate in a regular exercise program.

Some recommendations made by focus group participants to help improve the program, eliminate dropping out, or increase participation consisted of purchasing various types of exercise equipment to be placed on site and changing certain aspects of the program which would result in a fairer and more exciting program. Table 4.7 contains a list of their recommendations.

A discussion of the implications of these results in relation to the previously stated research hypotheses follows in Chapter V.

Table 4.7

Employee Recommendations to Improve to the Town of  
Blacksburg's Be T.U.F.F. Program Made at the Three Focus  
Group Sessions (Blacksburg, Virginia)

---

---

1. Purchase stationary bikes, steppers, etc. to be placed on site for employee use during lunch breaks or after work.
2. Install aerobic room with mirrors and showers on site for employee use during lunch and work hours.
3. Encourage supervisor and co-worker support so employees can exercise regularly without feeling guilty.
4. Lower or eliminate the cost for employees to use Town facilities such as the golf course and swimming pools.
5. Promote family exercise sessions such as swimming or family walks so employees are not taking time away from their families.
6. Blaze a hiking trail through the woods behind the Industrial Park for Town of Blacksburg employees and other nearby businesses employees to use. The cost could be shared with the other businesses and could be used to entice other businesses to locate there.
7. Eliminate incentive awards and put the money toward purchasing exercise equipment or discounts toward employees use of the Town's golf course or swimming pools.
9. Provide lost and found bicycles located at the Police Department to employees needing to make short work related trips as an alternative to taking a vehicle. Also, employees could use these bicycles for exercise during lunch breaks.
10. Assign all new joiners a "buddy" to help them establish a regular exercise routine, calculate their target heart rate, complete forms, etc.

11. Establish a fairer system. Some nonparticipating employees resent seeing others continually leaving work early to exercise when they cannot.
  12. Change the amount of exercise required from thirty minutes to twenty minutes.
  13. Develop exercise equivalents for employees who walk for hours reading water meters, mark or patch roadways, rake leaves and grass, work on water and sewer ditches, etc. so these physical activities can be counted as one point of exercise.
  14. Have department-wide programs or competitions.
- 
-

## CHAPTER V

### Discussion

The Town of Blacksburg's Be T.U.F.F. program has been well received by participating employees. In 1992, the participation rate was 46.9%. Despite this level of participation, statistical analysis did not reveal sick hours taken or health care dollars spent by participants differed significantly from nonparticipants. In addition, only a select group of employees have joined the program. These findings and others obtained from this analysis are discussed in this chapter in light of existing research on worksite health promotion.

#### Demographics and Behavioral Characteristics

An analysis of the entire employee population showed that participants have significantly higher incomes and are in higher job classifications than nonparticipants. Marvis et al., (1992) and Brill et al., (1991) found similar results in their research. These findings suggest that better educated employees are motivated to join health promotion programs and may be more aware of their own health and the benefits of exercise. Less educated and lower paid employees appear less inclined to join an exercise program.

Focus group results showed that Blacksburg employees with lower incomes and lower job positions face greater difficulties in finding time to exercise since many work two

jobs, getting permission from their supervisor to exercise, and affording the costs of joining a fitness center. Thus, to achieve greater participation in the program and aid in reducing sick days taken and health care dollars consumed, the Be T.U.F.F. program should target lower income and less educated employees and make adjustments which would better accommodate them.

Women were more likely than men to participate in the Be T.U.F.F. program. Marvis et al., 1992; Zavela et al., 1988; and Sloan and Gruman, 1988 also found participants were more likely to be female. This is possibly a result of the fact that women see exercise as a means of losing weight and becoming more physically attractive. Men may view exercise differently. Also, many Blacksburg male employees have physically active jobs. Thus, the Be T.U.F.F. program should be marketed in a way to also attract males or to give credit for physical activity accomplished in other settings, i.e., on the job or on the farm.

No difference in participation rates was found by smoking status. Other research has shown smokers tend to not join these types of programs (Zavela et al., 1988; Conrad, 1987; Sloan and Gruman, 1988; and Mavis et al., 1992. The Town's Be T.U.F.F. program has attracted 16 smokers. The Be T.U.F.F. program should keep track of the smoking status of participants in the future to determine if

smokers who join have higher quit rates than smokers who do not participate.

The theory of diffusion states that people adopt innovations such as exercise at different rates. People who are better educated, have higher incomes, and are respected by others tend to adopt a new behavior first (Rogers, 1983). Blue collar employees who usually have lower incomes and are less educated may be cautious about adopting an innovation since they cannot afford to be frivolous and have less discretionary time. This is evident in the Town of Blacksburg's Be T.U.F.F. program. If diffusion theory is correct, employees will continue to join the Be T.U.F.F. program as long as promotional and educational efforts are reconfigured to appeal to current nonparticipants. Also, current participants can act as role models and help accelerate the adoption rate of exercise among the middle and late majorities.

### Sick Hours

The number of sick hours used by participants, as well as nonparticipants, has decreased slightly since 1988, with participants showing the largest reduction. However, the number of sick hours used by these two groups was not significantly different (Table 4.2). One explanation for these reductions could be that employees in both groups have

become more aware of their own personal health and may be taking steps to modify or eliminate unhealthy lifestyle behaviors. The Town of Blacksburg has provided wellness sessions, health screenings, and health information to all employees. Offering these activities to nonparticipants may have encouraged them to make positive lifestyle changes which have contributed to fewer sick hours being taken.

Sick hours used by participants rose nearly 25% the first full year the program was in place while usage among nonparticipants rose only 15%. This initial increase could be due to risk detection programs which identified participants with high cholesterol levels, high blood pressure and prompted doctor visits. Another possibility is that participants may have incurred some initial exercise related injuries which resulted in more medical care being sought. Regardless, following this initial increase, the number of sick hours taken by participants has declined. In 1992, participants' usage was 16.6% lower than the year the program began while nonparticipants' usage was only 2.8% lower. In 1992 there was 9.81 hours difference between the participants and nonparticipants. This figure resembles the 9 hour difference found by Baun et al., (1986).

## Health Care Costs

Health care dollar expenditures have nearly tripled for both participants and nonparticipants since 1987.

Nonparticipant costs have been continually rising over the last six years. Participants' increases followed the same pattern until 1989. In fact, between 1987 and 1988, a sharp increase (65%) was seen in the amount of health care dollars used by participants. Gibbs' et al., (1985) research also found a 57.4% initial increase in health care dollars spent by participants.

After the initial increase, health care dollars spent by Be T.U.F.F participants dropped by one-third from 1988 to 1989. Since that time usage has remained steady but has never declined to the pre-program level. Health care expenditures by nonparticipants has continued to increase.

Although the amount of health care dollars spent by participants was not significantly different from nonparticipants, the difference between these two groups is growing. In 1992 there was a 48.6% difference between the participants and nonparticipants. This figure approximates 45.7% reduction in health care costs reported by Bowne et al., (1984) and 48.2% reported by Baun et al., (1986). If both groups continue in the same direction, a significant difference in health care costs may be found in the near future. Thus, this research suggests that worksite exercise

programs not be abandoned readily for lack of results since the benefits of exercise may not be exhibited for several years.

### Participant Questionnaires

The Town of Blacksburg generated a questionnaire to be completed by participants of the Be T.U.F.F. program after it had been in place for two and one-half years. Exercisers indicated the reasons they had initially joined and continued to participate in the exercise program was to preserve their future personal health and that exercising made them feel better. Receiving incentive awards was the third most important motivator for them to exercise. Many participants also indicated they would not change any aspects of the program.

However, since it has been determined that more educated and higher pay grade/higher paid employees are the predominant participants in the program, those completing this questionnaire would exhibit those characteristics. Most likely, such employees would most likely already know the value of exercise and may not need extra incentives for them to participate in such a program. In addition, they are currently participating in the program, and would see no need to change any aspects of the program. Had nonparticipants completed this questionnaire, different

responses would most likely have been obtained. To acquire a nonparticipants perspective about exercise and the Be T.U.F.F. program, focus groups were conducted with them and are discussed in the following section.

### Focus Groups

All employees participating in the focus groups were either drop outs of the Be T.U.F.F. program or employees who had never participated in the program. When these employees were asked if they believed exercise was important to their health, everyone said yes. This may be a result of the Town's efforts to educate all employees about their health by supplying health related material to their employees free of charge and allowing employees to participate in health screenings and health fairs.

Nonparticipant's ideas and opinions about the Be T.U.F.F. program were different from what participants had indicated on the questionnaires. It appears that the Be T.U.F.F. program does not cater to them. Many of these employees only have 30 minute lunch breaks, have physically demanding jobs, do not have a flexible work schedule, and have farm work to do after hours. Many of these employees do not have the money, time, or supervisor support necessary to allow them to participate in the program the way it is currently structured. Adding a component to the program

which would incorporate exercise equivalents for employees who walk for hours reading water meters, repairing roads and water and sewer lines, or perform other physical tasks would allow these employees to participate in the program also.

#### Confounding Events/Artifacts

At least three factors could have potentially affected the results of this study. They are listed below.

(1) When an employee has used all the sick time the Town of Blacksburg has allowed them but is still unable to return to work, he/she must then begin using vacation time. Thus, some illnesses may have resulted in more sick hours being taken than were actually indicated since vacation time was used instead. In addition, sick hours are also used when a family member is sick or when an employee attends a funeral. This would result in sick hours being charged to them even though they themselves did not have a personal illness. Occurrences such as these would result in an inaccurate amount of sick hours being charged to that employee.

(2) Exercise reporting by participants is on the honor system. When an employee marks one point for exercise it is assumed that the activity was sufficient to promote significant improvements in cardiovascular fitness. The possibility that an employee would cheat or embellish

reported exercise activities is possible. This would result in the employee being considered an exerciser but his or her health care costs and sick days would not have been reduced.

(3) The two variables used in this study, sick days taken and health care dollars expended, may not be particularly sensitive to the program's input. They could have changed due to reasons unrelated to the exercise program or the work environment. Other variables which could be valuable in discerning the impact of an exercise program in any future evaluation are: family health care expenditures, employee morale, productivity, and employee weight and dietary changes made by the employee which would protect against heart disease and other health risks.

#### Research Implications and Recommendations

The findings of this study provide important information which should be considered by health educators and employers prior to implementing a worksite exercise program. First, it appears that most employees are already aware of the benefits of exercise and how much exercise one should get; one problem is motivating people to begin and continue an exercise routine. Incentive awards are one option that motivates some people, however, this area needs further research.

National rates of increase in health care costs averaged 18% per year from 1986 to 1990 (Lyne, 1990) and 17% in 1992 (Brown, 1993). The Town's average rate of increase from 1987 to 1990 was 47% which was considerably higher than the national average. However, in 1991, the Town's rate of increase was 10% and 1992 saw a 0% increase in health care costs. Thus, the Town of Blacksburg has been successful in lowering its health care claims, but only after the Be T.U.F.F. program had been in place three years. Before implementing a worksite exercise program an organization should make sure enough funds and personnel resources are available to allow continuation of the program for several years. Significant cost savings should not be expected immediately thus the program should not be abandoned if anticipated results do not appear promptly.

In addition, health related material and screenings should be available to all employees, not just participants. Focus group discussions suggest many nonparticipants already get sufficient exercise but could benefit from having access to other health-related information. Health education materials should not be designed only to provide facts, but to motivate individuals to take action and to encourage others to maintain this exercise regimen.

Recommendations and suggestions to the Town of Blacksburg's Be T.U.F.F. program are listed in Table 5.1 and Table 5.2.

Table 5.1

Recommendations for the Town of Blacksburg's Be T.U.F.F.  
Program (Blacksburg, Virginia)

---

---

- Add components to the program which will promote more participation of older, male, lower paid, lower pay grade employees.
  - Expand the Be T.U.F.F. program to include other wellness areas such as smoking cessation, cancer detection, nutrition and weight loss, blood pressure control, etc.
  - Promote success of the Be T.U.F.F. program in the local community.
  - Change site coordinators periodically to promote variety and enthusiasm. See that coordinators receive training initially and periodically.
  - Drop the heart rate requirements and reevaluate other requirements for earning exercise points in light of recent research showing that benefits can be achieved in many ways, i.e., gardening, chopping wood, etc., and in small time increments (e.g. 10 minutes, 5 minutes) as long as they add up over the course of a day.
  - Expand the program to focus on smoking cessation which can have a significant impact on employee and family well being, sick hour usage, and health care costs.
  - Obtain better statistical data from BC/BS on a regular basis. The insurer should be able to classify claims due to preventable or nonpreventable causes and to discriminate between employee and family claims, costs, etc.
- 
-

Table 5.2

Suggestions for the Town of Blacksburg's Be T.U.F.F. Program  
(Blacksburg, Virginia)

---

---

- Continue the program and statistically analyze health care dollars used and sick hours taken by participants and nonparticipants each calendar year. Also, expand the statistical analysis to include family members health care dollar expenditures.
- Continue to provide various, health screenings, and health information to all employees making sure materials can be understood by employees with lower literacy levels.
- Help participants become a closer knit group by informing participants of others exercise habits and the benefits realized due to the program.
- Provide participants with examples of other company worksite exercise programs so they can feel proud and appreciative of Be T.U.F.F. program and all that it offers.
- Follow-up on participants who do not meet each quarter's goal to provide support and encouragement and help alleviate the problem of dropping out.
- Keep better records on who actively participates and achieves the program goals and who does not.
- Provide exercise equipment and showers on site.
- Promote family exercise sessions.
- Use a buddy system for new joiners to help them start a regular exercise program and answer questions they may have.
- Educate employees about the importance of seeking medical help early and having a regular doctor. Discourage emergency room use.

- Track sick days more carefully so only actual employee illnesses will be used and the sick leave statistic will be more meaningful.
- Obtain more accurate accounting of how much money is spent on the Be T.U.F.F. program.

## Conclusion

Statistical analysis of health care costs and absenteeism did not produce evidence to support the effectiveness of the worksite exercise program. Significance may not have been found due to one or more of the following: a lack of statistical power; use of available raw measures; and a small sample size. In addition, the power of the single intervention (exercise) may be too small to impact health care costs and sick leave taken.

However, the researcher believes that a worksite exercise program can produce benefits. There is other evidence that shows that the Be T.U.F.F. program has had an impact. All employees surveyed believed in the benefits of regular physical activity suggesting that wellness activities and the Town's emphasis in fitness may have influenced nonparticipants. Both groups used in this analysis obtained regular physical activity, whether through Be T.U.F.F. or on the job.

Money allocated to continue the Town of Blacksburg's worksite exercise program in 1989 was \$6,000. This amount was allocated for health club fees, incentive awards, and health fair and screenings for all employees and their immediate families. In 1990, the budget was \$2,400 (a reduction of more than 50%) and two years later it was

reduced to \$2,000 with employees paying all but \$10.00 toward the health club fees. The cost of the program and the investment is only approximately \$22.00 per participant. But, every sick leave day saved (estimated cost per day sick is \$81.66) by the program, covers the Town of Blacksburg's investment in four employees participation cost.

With the cost of health care continuing to rise and the fact that by the year 2030, 25% of the United States population will be over the age of 60, it is important that we help workers develop positive lifestyle behaviors now, so they can carry them with them for years (Pander, 1989). If that were to happen, we would soon have the healthiest retired generation ever and this group will not put such a burden on our health care system.

Replication of this preliminary investigation over the next few years is recommended. Also, the amount of health care dollars participants and nonparticipants family members spend should be analyzed to determine if the program has had any affect upon family members of participants.

## REFERENCES

- American Heart Association. (1989). Exercise and your heart. Dallas, TX.
- Baun, W. B., Bernacki, E. J., & Tsai, S. P. (1986). A preliminary investigation: Effect of a corporate fitness program on absenteeism and health care cost. Journal of Occupational Medicine, 28(1), 18-22.
- Belloc, N. B. (1973). Relationship of health practices and mortality. Preventive Medicine, 2, 67-81.
- Blair, S. N., Piserchia, P. V., Wilbur, C. S., & Crowder, J. H. (1986). A public health intervention model for work-site health promotion. Journal of the American Medical Association, 255(7), 921-926.
- Bly, J. L., Jones, R. C., & Richardson, J. E. (1986). Impact of worksite health promotion on health care costs and utilization. Journal of the American Medical Association, 256(23), 3235-3240.
- Bowne, B. W., Russell, M. L., Morgan, J. L., Optenberg, S. A., & Clarke, A. E. (1984). Reduced disability and health care costs in an industrial fitness program. Journal of Occupational Medicine, 26(11), 809-816.
- Brennan, A. J. J. (1982). Health Promotion: What's in it for business and industry? Health Education Quarterly, 9, 9-19.
- Brill, P. A., Kohl, H. W., Rogers, T., Collingwood, T. R., Sterling, C. L., & Blair, S. N. (1991). The relationship between sociodemographic characteristics and recruitment, retention, and health improvements in a worksite health promotion program. American Journal of Health Promotion, 5(3), 215-221.
- Brown, S. (1993). Blue Cross Blue Shield of Virginia, Roanoke, Virginia.
- Castillo-Salgado, C. (1984). Assessing recent developments and opportunities in the promotion of health in the American workplace. Social Science Medicine, 4, 349-357.

- Chen, M. S. (1989). The most important influences in health promotion: Continuation of the panel discussion. Health Education, 6, 34-36.
- Chenoweth, D. (1983). Health promotion: Benefits vs. costs. Occupational Health and Safety, 7, 37-41.
- Conrad, P. (1987). Who comes to work-site wellness programs? A preliminary review. Journal of Occupational Medicine, 29(4), 317-319.
- Cox, M., Shephard, R. J. & Carey, P. (1981). Influence of an employee fitness program upon fitness productivity and absenteeism. Ergonomics, 24(10) 795-806.
- Davis, K. E., Jackson, K. L., Kronenfeld, J. J., & Blair, S. N. (1984). Intent to participate in worksite health promotion activities: A model of risk factors and psychosocial variables. Health Education Quarterly, 11(4), 361-376.
- Department of Health and Human Services. (1986). The National Heart, Lung, and Blood Institute Fiscal Year 1986 Fact Book. Bethesda, MD.
- Donoghue, S. (1977). The correlation between physical fitness, absenteeism, and work performance. Canadian Journal of Public Health, 68(3) 201-203.
- Eakin, J. M., Gotay, C. C., Rademaker, A. W., & Cowell, J. W. F. (1988). Factors associated with enrollment in an employee fitness center. Journal of Occupational Medicine, 30(8), 633-636.
- Edmonds, K. A. (1991). 1991 Sick Leave Analysis. Unpublished Report. Town of Blacksburg, Personnel Reports. Blacksburg, Virginia.
- Edmonds, K.A. (1993). Town of Blacksburg, Blacksburg, Virginia.
- Ellis, W. S. & Murphy, R. J. (1986). The case for health promotion programs containing health care costs: A review of the literature. The American Journal of Occupational Therapy, 40(11), 759-763.
- Fielding, J. E. (1988). The proof of the health promotion pudding is . . . Journal of Occupational Medicine, 30(2), 113-115.

- Fielding, J. E. & Breslor, L. (1983). Health promotion programs sponsored by California employers. American Journal of Public Health, 73(5) 538-542.
- Fue, V. R. (1993). No Pain, No Gain. Journal of the American Medical Association, 5, 631-633.
- Gebhardt, D. L. & Crump, C. E. (1990). Employee fitness and wellness programs in the workplace. American Psychologist, 45(2), 262-272.
- Gibbs, J. O., Mulvaney, D. M., Henes, C., & Reed, R. W. (1985). Work-site health promotion. Journal of Occupational Medicine, 27(11) 826-830.
- Golaszewski, T., Wassel, M. L., Yen, L., Lynch, W., & Vickery, D. M. (1990) The refinement of a worksite health promotion post-program evaluation instrument. Health Education, 21(2) 45-49.
- Green, L. W. (1990). Community Health (6th ed.). St. Louis: Carlisle.
- Green, L. W. & Kreuter, M. W. (1991). Health Promotion Planning: An Educational and Environmental Approach (2nd ed.). Mountain View, CA: Mayfield.
- Hatziandreu, E. I., Koplan, J. P., Weinstein, M. C., Caspersen, C. J., & Warner, K. E. (1988). A cost-effectiveness analysis of exercise as a health promotion activity. American Journal of Public Health, 78(11), 1417-1421.
- Hollander, R. (1986). Fortune 500 companies big on wellness, short on evaluation. Corporate Commentary, 3, 51-52.
- Kar, S. B. (1974). Implications of diffusion research for a planned change. International Journal of Health Education, 76(3), 192-200.
- Karch. (1987) Monitoring our progress. Fitness in Business, 1(6), 231.
- Lynch, W. D., Golaszewski, T. J., Clearie, A. F., Snow, D., & Vickery, D. M. (1990). Impact of a facility-based corporate fitness program on the number of absences

from work due to illness. Journal of Occupational Medicine, 32(1), 9-12.

Lyne, D. J. (1990) International Foundation of Employee Benefits. 7th Edition.

Mavis, B. E., Stachnik, T. J., Gibson, C. A., & Stoffelmayr, B. E. (1992). Issues related to participation in worksite health promotion: A preliminary study. American Journal of Health Promotion, 7(1), 53-59.

Nobbelin, G. G. (1990). Improving The Odds: A Healthier Worksite, a Primer on Health Promotion. Center for Health Promotion, Michigan Department of Public Health.

Pappas, G., Queen, S., Hadden, W., and Gisher, G. (1993). The increasing disparity in mortality between socioeconomic groups in the united states, 1960 and 1986. The New England Journal of Medicine, 329(2), 103-109.

Pender, Nola J. (1989). Health promotion in the workplace: Suggested directions for research. American Journal of Health Promotion, 3(3), 38-42.

Powell, K. E., Thompson, P. D., Caspersen, C. J., & Kendrick, J. S. (1987). Physical activity and the incidence of coronary heart disease. Annual Review of Public Health, 8, 253-287.

Public Health Service. (1990). Year 2000 Objectives For The Nation. Washington, DC: U.S. Department of Health and Human Services, p. 1.

Reinhardt, U. E. (1990). Rationing the health-care surplus: An American tragedy. In P. R. Lee and C. L. Estes Third Edition The Nation's Health. (pp. 104-111). Jones and Bartlett Publishers, Boston.

Rogers, E. M. (1983). Diffusion of Innovations (3rd ed,). New York: The Free Press.

Shephard, R. J. (1985). The impact of exercise upon medical costs. Sports Medicine, 2, 133-143.

Shephard, R. J. (1989). Exercise and employee-wellness initiatives. Health Education Research, 4(2), 233-243.

Shephard, R. J. (1992). Twelve years experience of a

fitness program for the salaried employees of a Toronto life assurance company. American Journal of Health Promotion, 6(4), 292-301.

Shephard, R. J., Corey, P., Renzland, P., & Cox, M. (1982). The influence of an employee fitness and lifestyle modification program upon medical care costs. Canadian Journal of Public Health, 73(4), 259-263.

Shephard, R. J., Corey, P., Renzland, P., & Cox, M. (1983) The impact of changes in fitness and lifestyle upon health care utilization. Canadian Journal of Public Health, 74, 51-54.

Sloan, R. P. and Gruman, J. C. (1988). Participation in workplace health promotion programs: The contribution of health and organizational factors. Health Education Quarterly, 15(3), 269-287.

U. S. Department of Health, Education, and Welfare. (1979). Healthy People: Surgeon General's Report on Health Promotion and Disease Prevention. Washington, DC.

Weiss, C. H. 1972). Evaluation research: Methods of Assessing Program Effectiveness, Englewood Cliffs, NJ; Prentice-Hall.

Wilber, C. S. (1983). The Johnson & Johnson program. Preventive Medicine, 12, 672-681.

Wood, A. E., Olmstead, G. W. & Craig, J. L. (1989). An evaluation of lifestyle risk factors and absenteeism after two years in a worksite health promotion program. American Journal of Health Promotion, 4(2), 128-133.

Zavela, K. J., Davis, L. G., Cottrell, R. R., and Smith, W. E. (1988). Do only the healthy intend to participate in worksite health promotion? Health Education Quarterly, 15(3), 261-267.

APPENDIX A

## **AABo TUFF** Program Objectives

1. To help employees establish a routine of exercising on a regular schedule.
2. To establish a cohesive "team spirited" exercise effort among employees.
3. To encourage employees in their efforts to become more fitness concious by recognizing their achievments with incentive awards
4. To monitor overall fitness and health levels of participants through periodic testing administered by the Fitness Connection, Montgomery Regional Hospital personnel, or the Carilion Employee Assistance Program.

## "Be T.U.F.F." Program Basic Rules

1. All employees may participate in the "Be T.U.F.F." program. Upon joining, "Be T.U.F.F." participants will receive a free "Be T.U.F.F." gift, a brochure detailing the program and a progress sheet.
2. Exercising may be done on the employee's own time (on honor) or during the workday, providing that one has the necessary approval of his/her supervisor and that time is made up as appropriate.
3. Participants may use many types of exercise to gain points – walking, jogging, swimming, bicycling, weightlifting, tennis, racquetball, aerobics, etc . . . as long as objectives of getting one's heart rate to its target zone (see chart below) and maintaining that level for a least 30 minutes are met.
4. Heart rates need to be documented on progress sheets for an employee's first quarter of exercise. Anyone needing help taking his/her heart rate should consult a current "Be T.U.F.F." member or a site coordinator.
5. Participants cannot exercise more that once daily and have it count for more than one day (or twice as long and count it for more than one day).
6. Participants may not carry over points from one quarter to the next.
7. Participants must finish all four quarters before starting the following year.
8. An employee spouse would not at this time be eligible to work toward "Be T.U.F.F." incentive awards.

<b>COMPUTING HEART RATE TARGET ZONE</b>			
Age (years)	Target Zone 60-75% (beats per minute)	Average Maximum (HR 100%)	
20	120-150	200	
25	117-146	195	
30	114-142	190	
35	111-138	185	
40	108-135	180	
45	105-131	175	
50	102-127	170	
55	99-123	165	
60	96-120	160	
65	93-116	155	
70	90-113	150	

# "Be T.U.F.F." Program

## Requirements for Earning Awards and Fee Structure

**REQUIRED**  
Exercise 30 minutes/day, 3 days/week (1 point per day of exercise)  
Earn 36 points per 3 month quarter

- Participants can earn an extra incentive award by achieving 48 points each for two consecutive quarters.
  - Documented heart rates are only required for the 1st quarter of the 1st year (1-3 heart rates per workout should be recorded on the participant's progress sheet).
    - A suggestion to walkers or runner: could be a resting rate at first or after a warm-up; immediately after walking briskly; and then when you're cooling down -- maybe 3-4 minutes later. (See chart under basic rules for actual target zone/age comparison.)
  - Participants may earn 1 point for each:
    - a. Wellness Session enrolled/attended; and/or
    - b. Preventive medical care visit/test (up to a maximum of 3 points per quarter)
- in his/her 36 point/quarter requirement of exercise. Participants may include these points in earning the extra incentive award above.

### FEE STRUCTURE

*All fees are payroll deducted.*

#### Fee

\$5.00/year

Initiation \$50.00 single  
\$78.00 family

Monthly \$24.00 single  
Dues \$40.50 family

#### Exercise Option

Alternate Exercise Program (your choice of exercise)

#### Fitness Connection Membership

*Unless an enrollment "special" is being offered, employees will be responsible for paying the entire initiation fee.*

Employees joining the Fitness Connection will need to stop by the facility on North Main Street and pay the initiation fee and first month's dues. Payroll deduction would then start the following month.

## "Be T.U.F.F." Program Awards

Participants will earn 1 point per day of exercise  
Points needed per quarter – 36 points (3 days per week of exercise)

### First Year Participants

- 1st Quarter Fitness T-shirt
- 2nd Quarter Sports Towel
- 3rd Quarter Tote Bag
- 4th Quarter 1/2 day vacation or \$50 Savings Bond

### Second Year Participants

- 1st Quarter Insulated Sports Bottle
- 2nd Quarter Fitness T-shirt with shorts
- 3rd Quarter Fitness Sweatshirt
- 4th Quarter \$100 Savings Bond

### Third Year Participants

Choice of: (approximate \$20 value per quarter)

- 1/2 day vacation
- \$50 U.S. Savings Bond
- \$20 in health insurance premiums  
(dependent coverage)  
(on a reimbursement basis)
- \$20 discount on Town services
  - \* golf course fees
  - \* BT pass (quarter)
  - \* Parks and Recreation Programs

Awards from years 1 and 2 (does not include \$100 Savings Bond or Locker Bag)

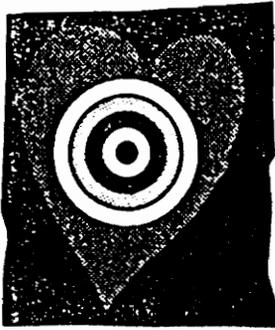
*Points needed per quarter for two consecutive quarters to earn incentive award –  
48 points (4 days per week of exercise)  
\$10.00 gift certificate to CMT*

*\*If a participant is eligible to receive an award from the first year awards but the appropriate size is no longer available or the item stock has been depleted, the participant may choose an award from the same quarter of the next year.*

# be TUFF.



**Blacksburg Employees Team Up For Fitness**



## TARGET HEART RATE ZONE

Your maximum heart rate is usually 220 minus your age. However, the figures included in the Target Heart Rate Chart are averages and should be used as general guidelines.

To determine whether you are within your Target Heart Rate Zone, learn to count your pulse. The pulse may be felt either at the side of the neck (Carotid Artery) or at the wrist on the thumb side (Radial Artery).

To find your pulse at the Carotid Artery, gently place three fingers at your neck, below the lower jaw in a line below and forward on your ear. To find your pulse at the Radial Artery, turn one hand palm up and reach under the wrist just below the base of the thumb. Never use your thumb when feeling for your pulse because it has a pulse of its own.

You should check your pulse periodically when exercising to make sure that your heart rate is within its Target Zone. It is important to count your pulse immediately upon stopping exercise because your pulse rate may change very

(continued on back)

quickly once exercise is slowed or stopped. Find your pulse within a few seconds and count the number of beats for 10 seconds and multiply that number by six (6) for a full minute pulse rate. (Heart rates provided in the chart are full minute pulse rates.) When exercising you do not want to count your pulse for the whole minute or even for 15 seconds because your pulse rate will start to slow down during that period.

Once you have thoroughly checked your own responses to exercise, you will begin to recognize certain normal sensations you have when you are in your Target Heart Rate Zone and you will learn how much effort it takes to get you there.

Over a period of time your body will adjust to the exercise intensity. This will be apparent when the same intensity of exercise yields a lower average heart rate. At this point, it is necessary to adjust your level of exercise intensity in order to elicit a heart rate within your Target Zone, i.e., by exercising harder, faster, or against more resistance.

Montgomery Regional Hospital  
Occupational Health Program  
Route 460 South  
Blacksburg, VA 24090



**Participant Registration/Consent Form**

Name: \_\_\_\_\_ Age: \_\_\_\_\_  
Department: \_\_\_\_\_ Site Coordinator: \_\_\_\_\_  
Aerobic Activity: \_\_\_\_\_ Date Joined: \_\_\_\_\_

---

**Consent**

As a member of Be T.U.F.F., I intend to engage in physical fitness activities. I understand the risk and exposure to personal injury involved in these exercises, and acknowledge that my participation is completely voluntary. I hereby release in full the Town of Blacksburg, or other organizations associated with this program, parent and affiliated companies, and employees as well as representatives from any and all liability arising from or connected to my participation in this program.

- ( ) I consent to paying \$5.00 annual membership fee for participation in the Town of Blacksburg alternate exercise program, to be payroll deducted in one sum.
  - ( ) I am currently a member of the Fitness Connection.
  - ( ) I wish to participate in an aerobics (or other exercise) class offered by the Town or other agency listed below:
- 

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**©Montgomery Regional Hospital, 1988  
Occupational Health Program  
Route 460 South  
Blacksburg, VA 24060**

ENROLLMENT FORM

Corporate Membership in Fitness Connection

Initiation Fee - ONE TIME FEE\*  
(Cost for 25+ interested employees)

\$50.00 (Single Membership)  
\$78.00 (Family Membership)

\*Special thru November 30, 1989, \$25.00 off single or family membership

Monthly Fee

Single \$24.00  
-10.00 (Town would contribute for you)  
\$14.00 (Net monthly cost for employee for single membership)

Family \$40.50  
-10.00 (Town would contribute for you)  
\$30.50 (Net monthly cost for employee family membership)

As is currently the case, all employee costs would be payroll deducted.

I am interested in enrolling as a member of the Fitness Connection following the above fee structure. I agree that if I choose to exercise during the workday, it is subject to the approval of my supervisor and I take responsibility for adjusting my work schedule to make up any time missed from work. I understand that I am obligated to pay for the current month's membership if I leave the employ of the Town or withdraw as a member of the Fitness Connection. I agree to turn in my I.D. to the Fitness Connection to stop further billing if this situation occurs.

\_\_\_\_\_ Single Membership

\_\_\_\_\_ Family Membership

\_\_\_\_\_  
Signature

I am \_\_\_\_\_

I am not \_\_\_\_\_ currently enrolled in the Be T.U.F.F. program.

Resting Heart Rate: \_\_\_\_\_  
 Heart Rate Target Zone: \_\_\_\_\_



**PARTICIPANT MONTHLY PROGRESS RECORD**

Name: \_\_\_\_\_  
 Department: \_\_\_\_\_  
 Site Coordinator: \_\_\_\_\_  
 Total Points: \_\_\_\_\_

**DECEMBER 1990**

DAY	DATE	ACTIVITY	EXERCISE HEART RATE			DISTANCE/DURATION	POINTS
			warm-up	during	cool-down		
SATURDAY	1						
SUNDAY	2						

DAY	DATE	ACTIVITY	EXERCISE HEART RATE			DISTANCE/DURATION	POINTS
			warm-up	during	cool-down		
MONDAY	3						
TUESDAY	4						
WEDNESDAY	5						
THURSDAY	6						
FRIDAY	7						
SATURDAY	8						
SUNDAY	9						

DAY	DATE	ACTIVITY	EXERCISE HEART RATE			DISTANCE/DURATION	POINTS
			warm-up	during	cool-down		
MONDAY	10						
TUESDAY	11						
WEDNESDAY	12						
THURSDAY	13						
FRIDAY	14						
SATURDAY	15						
SUNDAY	16						

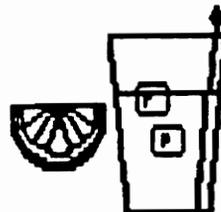
**Be. T.U.F.F.  
THIRD QUARTER  
AWARDS LUNCHEON**

**SEPTEMBER 18TH  
12:00  
FIRST FLOOR CONFERENCE ROOM**



**MENU: FRUIT SALAD, VEGETABLE SALAD  
SANDWICHES AND FROZEN YOGURT**

**THE TOWN MANAGER WILL BE GIVING OUT  
THE BE T.U.F.F. AWARDS AT THE LUNCHEON.**



APPENDIX B

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Informed Consent for the Town of Blacksburg

Title of Project: Evaluation of a Municipal Government's  
Worksite Exercise Program on Health Care  
Costs, Absenteeism, and Variables Associated  
with Participation

Principal Investigator: Angela Pruett, Master's Candidate,  
Community Health Education

**I. THE PURPOSE OF THIS RESEARCH/PROJECT**

The Town of Blacksburg has been invited to participate in a study about worksite exercise programs. This study involves experimentation for the purpose of determining if regular exercise produces employees who use fewer health care costs and fewer absences. The study also investigates attitudes, beliefs, and demographics of participants and nonparticipants in a worksite exercise program. Approximately 100 employees at the Town of Blacksburg will be involved in the study.

**II. PROCEDURES**

The procedures to be used in this research consist of abstracting data from computer generated absenteeism reports, Blue Cross/Blue Shield of Virginia health care costs reports, and previously distributed surveys taken by participants. Small focus groups with nonparticipants will be conducted to gather additional data concerning of the worksite exercise program.

**III. BENEFITS OF THIS PROJECT**

The Town of Blacksburg's participation in the project will provide the following information.

- Do worksite exercise programs significantly reduce employer's health insurance premiums?
- Do worksite exercise programs significantly reduce employee absenteeism?
- What attitudes, beliefs, and characteristics do participants in worksite exercise programs possess that nonparticipants do not?
- What components of a worksite exercise program are most important in promoting maximum participation?

No guarantee of benefits has been made to the Town of Blacksburg. The Town of Blacksburg will receive a copy of this research when completed.

**IV. EXTENT OF ANONYMITY AND CONFIDENTIALITY**

Data used in this evaluation will have employee names removed and only a subject number will identify employees during analysis and written reports of the research.

**V. COMPENSATION**

The Town of Blacksburg will receive no monetary compensation for participating in this evaluation. However, a report detailing the impact of their program on employee health care costs, employee absenteeism, characteristics of employees participating in the worksite exercise program, and recommendations to improve the program will be provided free of charge.

**VI. FREEDOM TO WITHDRAW**

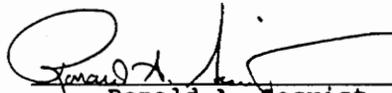
The Town of Blacksburg is free to withdraw from this study at any time without penalty.

**VII. APPROVAL OF RESEARCH**

This research project has been approved as required, by the Institutional Review Board for Projects Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Department of Health and Physical Education.

**VIII. SUBJECT'S RESPONSIBILITIES**

As Town Manager of the Town of Blacksburg, I know of no reason the necessary records and proposed procedures to conduct this evaluation should not be provided and carried out.

  
\_\_\_\_\_  
Ronald A. Secrist  
Town Manager

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY  
Informed Consent for Participants  
of Investigative Projects

Title of Project: Evaluation of a Municipal Government's  
Worksite Exercise Program on Health Care  
Costs, Absenteeism, and Variables Associated  
with Participation

Principal Investigator: Angela Pruett, Masters Candidate,  
Community Health Education

The Town of Blacksburg has been invited to participate in a study about worksite exercise programs. One aspect of the study investigates attitudes and beliefs of participants and nonparticipants in worksite exercise programs. Your participation in this focus group will help us better understand what employees want in an exercise program. All information obtained from this focus group will be kept strictly confidential. No individual comments or names will be identified.

This research project has been approved as required, by the Institutional Review Board for Projects Involving Human Subjects at Virginia Polytechnic Institute and State University and by the Department of Health and Physical Education in the College of Education.

If you would like to receive a synopsis or summary of this research when completed, please contact the Personnel Department.

-----  
I have read and understand the informed consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project. If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

I know of no reason I cannot participate in this study.

\_\_\_\_\_  
Signature  
-----

If you should have any questions about this research or its conduct, please contact:

\_\_\_\_\_  
Angela Pruett  
Investigator

\_\_\_\_\_  
961-1109  
Phone

\_\_\_\_\_  
Elizabeth H. Howze, Sc.D.  
Faculty Advisor

\_\_\_\_\_  
231-7116  
Phone

\_\_\_\_\_  
Janet Johnson  
Chair, IRB, Research Division

\_\_\_\_\_  
231-6077  
Phone

CERTIFICATION OF EXEMPTION OF PROJECTS INVOLVING HUMAN SUBJECTS

93-037

Principal Investigator(s): Angela W. Pruett, Dr. Elizabeth H. Howze, Dr. Douglas Southard, Dr. Jim Fortune

Department(s): Health and Physical Education, College of Education

Project Title: Evaluation of a Municipal Government's Worksite Exercise Program on Health Care Costs, Absenteeism, and Variables Associated with Participation

Source of Support: Departmental Research \_\_\_\_\_ Sponsored Research \_\_\_\_\_ Proposal No. \_\_\_\_\_

1. The criteria for "exemption" from review by the IRB for a project involving the use of human subjects and with no risk to the subject is listed below. Please initial all applicable conditions and provide the substantiating statement of protocol.

- a. The research will be conducted in established or commonly established educational settings, involving normal education practices. For example:
  - 1) Research on regular and special education instructional strategies;
  - 2) Research on effectiveness of instructional techniques, curricula or classroom management techniques.
- b. The research involves use of education tests ( \_\_ cognitive, \_\_ diagnostic, \_\_ aptitude, \_\_ achievement), and the subject cannot be identified directly or through identifiers with the information.
- c. The research involves survey or interview procedures, in which:
  - 1) Subjects cannot be identified directly or through identifiers with the information;
  - 2) Subject's responses, if known, will not place the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability;
  - 3) The research does not deal with sensitive aspects of subject's own behavior (illegal conduct, drug use, sexual behavior or alcohol use);
  - 4) The research involves survey or interview procedures with elected or appointed public officials, or candidates for public office.
- d. The research involves the observation of public behavior, in which:
  - 1) The subjects cannot be identified directly or through identifiers;
  - 2) The observations recorded about an individual could not put the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability;
  - 3) The research does not deal with sensitive aspects of the subject's behavior (illegal conduct, drug use, sexual behavior or use of alcohol).
- e. The research involves collection or study of existing data, documents, recording pathological specimens or diagnostic specimens, of which:
  - 1) The sources are publicly available; or
  - 2) The information is recorded such that the subject cannot be identified directly or indirectly through identifiers.

2. I further certify that the project will not be changed to increase the risk or exceed exempt condition(s) without filing an additional certification or application for use by the Human Subjects Review Board.

Note: If children are in any way at risk while this project is underway, the chairman of IRB should be notified immediately in order to take corrective action.

Angela W. Pruett 4/25/93  
Principal Investigator(s) Date

Elizabeth H. Howze April 28, 1993  
Principal Investigator(s) Date

[Signature] 5/3/93  
Departmental Reviewer Date

[Signature] 5/5/93  
Chair, Institutional Review Board Date

APPENDIX C

Be T.U.F.F. Member Survey

1. Since you've been in the program, how many quarters have you met the minimum number of points (36)? \_\_\_\_\_ (possible 10 quarters)
2. According to the level you are at presently, please rank the following in the order that motivates you to exercise [1 (strong motivator) through 4 (not a motivator at all) or 5 (not applicable)]

- \_\_\_\_\_ Award
- \_\_\_\_\_ Requirement to document
- \_\_\_\_\_ Future personal health
- \_\_\_\_\_ Money being paid by you to exercise
- \_\_\_\_\_ Makes you feel better at the present time (stress reducer)
- \_\_\_\_\_ Potential for reduced health care costs

3. According to the level you were at when you began the program, using the same ranking procedure, please rank the following in the order that motivated you to exercise at that time:

- \_\_\_\_\_ Award
- \_\_\_\_\_ Requirement to document
- \_\_\_\_\_ Future personal health
- \_\_\_\_\_ Money being paid by you to exercise
- \_\_\_\_\_ Made you feel better (reduced stress, more energy)
- \_\_\_\_\_ Potential for reduced health care costs

If #2 and #3 are ranked differently, what do you feel caused the difference?

---

---

---

---

4. If the awards are a strong motivator for you, how often do you think they should be given?

---

5. Again, if the awards are a strong motivator for you, do you see that changing in the future? \_\_\_\_\_ Yes \_\_\_\_\_ No

- If yes, after what time period?
- \_\_\_\_\_ 1-2 years
  - \_\_\_\_\_ 2-4 years
  - \_\_\_\_\_ longer than 4 years

6. What, if any, changes would you like to see in the program?

---

---

---

---

7. Would you continue in the program if awards were discontinued after a two-year period?     Yes     No
8. In a period of fiscal constraint, would you be willing to forego receipt of an award?     Yes     No
9. Do you have any ideas or creative cost saving measures which could be used to motivate/reward/recognize Be T.U.F.F. members for continuing their exercise program after two years?

---

---

---

---

Please return it to me by Friday, April 19.

THANKS FOR YOUR TIME!

APPENDIX D

### Focus Group Questions

1. Do you believe exercise is beneficial to your health?
2. Do you think you get enough exercise at work or working at home?
3. If you joined Be T.U.F.F. what barriers prevented you from actively exercising?  
  
or  
  
If you never joined Be T.U.F.F. what barriers prevented you from joining?
4. What changes or incentives would you like to see made to the worksite exercise program that might foster you joining now?

## VITA

The author of this thesis, Angela Ward Pruett, was born October 30, 1964, in Kingsport, Tennessee. She is the daughter of Mr. and Mrs. Ural T. Ward. Angela completed her secondary education at Volunteer High School in Church Hill, Tennessee.

The author received her Bachelor of Science degree in Environmental Health from East Tennessee State University, Johnson City, Tennessee on May 16, 1987. While at this institution, Angela served as Secretary of the Student National Environmental Health Association and was selected Outstanding Environmental Health Student her senior year.

The author began working for the Town of Blacksburg as a Secretary in the Finance Department on September 22, 1987. In January, 1989, she entered the Master of Science degree program in Health Education at Virginia Polytechnic Institute and State University as a part-time student.

Angela married W. Payton Pruett, Jr. on December 29, 1987.

*Angela W. Pruett*