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ABSTRACT

The Blacksburg (Virginia) municipal government's worksite exercise program, developed in response to rising health insurance premiums, was evaluated to determine its effect on health care costs and employee absenteeism. Thirty-two employees who participated in the program for 4.5 years were compared to 32 nonparticipating employees. The program design offered a management contribution toward a monthly fee to a local fitness club or payment of an annual $5 fee and the promise by employees to exercise on their own. Participants could engage in any exercise that would allow them to reach a target heart rate zone. The program also included annual fitness and health screening and free health education classes. Data analysis revealed: (1) there were no significant differences between participant and nonparticipant characteristics; (2) participants did not use significantly fewer sick hours or health care dollars than did nonparticipants; (3) after an initial increase in both variables the year after the program began, reductions were seen for participants in the following years; and (4) focus groups conducted with nonparticipants disclosed that most employees know exercise is beneficial but nonparticipation was due to 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 might need to be marketed to older, male, lower paid workers in lower job classifications since these groups tend not to join as readily as workers who are younger, female, and higher paid. (Contains 17 references.) (JB)

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

by

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(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 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.

Introduction

Today health care costs are rising faster than for 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, slowing this constantly increasing expenditure has become a top priority for them (Brennan, 1982). Absenteeism is another concern of employers. If a worker is not well enough to attend work and is not sick enough to see a doctor, the employer still loses money. One company estimated it loses an average of $82 per day per absent employee (Edmonds, 1991). For large organizations, employee absenteeism costs thousands of dollars 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 intended to promote healthier lifestyles among employees in hopes of lowering the incidence of heart disease, cancer, stroke, and injuries which are the four leading causes of death and disability in the United States today (Castillo-Salgado, 1984).

The recently released 1992 National Survey of Worksite Health Promotion Activities shows the growth in the number and scope of worksite health promotion activities since 1985 when the survey was last conducted (VSDHHS, 1993). Increasingly, companies that have instituted worksite health promotion programs

(usually large companies) have found that these investments have paid dividends. In this presentation we discuss the results of an evaluation of a physical activity program at a small worksite in a rural municipal government serving 35,000 people.

The Town of Blacksburg employs approximately 200 full-time and 100 part-time employees in departments such as Public Works, Police, Transit, Finance, Water and Sewer, Parks and Recreation, and Planning. Ninety-seven percent of the Town of Blacksburg's employees are white, and 66% are male. The average age of male employees is 38 and of female employees is 34. Sixty-eight percent are married and 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

1. Background.

The Town's worksite exercise program was developed in response to increasing health insurance premiums. During fiscal year 1987-88, the Town experienced a 39% increase in the cost of providing health insurance to its full-time work force and covered dependents. During fiscal year 1988-89, the Town saw a 47% cost increase and in fiscal year 1989-90 a 56% increase. While private enterprises have the option of raising the prices of their goods or services, as a local government the Town could not readily raise taxes to cover its rising health insurance premiums. Some of the costs were absorbed by the Town, but

employees were also required to pay higher premiums which, in turn, consumed most or all of their annual wage increases.

2. Components of the Program.

An employee committee was organized to plan the program and established objectives, rules, and an incentive awards structure. The logo for the program was "Be T.U.F.F.", an acronym for Blacksburg Employees Team Up For Fitness. Some members of this committee were designated as "site coordinators" with the responsibility of keeping records on participants at their location.

Employees had two options from which to choose. Management would contribute $10.00 toward a monthly fee of $24.00 for all employees wishing to join a local fitness club, or employees could pay an annual $5.00 fee to the Town and exercise on their own. As of 1991, 81 full-time employees were enrolled in the "Be T.U.F.F." program. 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.

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 participants' site coordinators and constituted the program's only type of record keeping.

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

To qualify for incentive 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, striving for 36 points per quarter. An extra incentive was offered to employees who exercised four or more days per week.

The program also provided annual fitness and health screenings for all full-time employees and their spouses and children, whether or not they were members of the Be T.U.F.F. program. In addition to health screenings, 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.

3. Evaluation of the Program.

The following three hypotheses were developed to guide the evaluation of the Be T.U.F.F. program.

Ho_1 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_2 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_3 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.

For purposes of this research, "participants" were identified as those full-time employees who had been working with 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. Thirty-two employees met these criteria.

Nonparticipants were randomly selected from a list of full-time employees who had worked for the Town of Blacksburg since 1987 but who 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 equalled the number of participants. This type of sampling was not intended to increase comparability but to select a representative sample of nonparticipants.

Results

1. Test of Hypothesis One.

A chi-square analyses showed no significant differences between participants and non-participants for age, job classification, marital status or salary (Table 1).

2. Test of Hypothesis Two.

All 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. Hours not used by the employee can be carried over from year to year.

Each employee must complete a leave slip and have it signed by a supervisor every time work is missed. The employee must indicate on the slip whether he/she is 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 the immediate family which requires the employee's attention.

Information from these slips is transferred to departmental time sheets which are then entered into the computer. An end-of-the-year payroll computer printout is generated which displays 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, and this year was omitted from this analysis. This program change allowed for faster processing only; the measuring instrument itself was not affected.

Data from the end of the year payroll reports were analyzed using the Number Cruncher statistical software program in a two-way ANOVA. Significance level was set at $p \leq 0.05$.

In 1987, the year before the program was given, participants used an average of 3.5 fewer sick hours than nonparticipants, a difference that was not significant (Figure 1). The next year, 1988, a 24.5% increase was seen in the number of sick hours taken by participants. Nonparticipants experienced a 15.0% increase that same year. This initial increase could be due to risk detection programs offered to all employees to identify those with high cholesterol levels and high blood pressure which may have triggered doctor visits. Another possibility is that participants may have incurred some initial exercise related injuries which resulted in more medical care being sought.

Following this initial increase, the number of sick hours used by both groups has declined. In 1989, the first full year the program was in place, participants exhibited a 31.9% decrease in the number of sick hours they used. Nonparticipants' usage also declined, reaching in 1992 approximately the same usage seen in 1986 and 1987.

In 1992, participants' usage was 16.6% lower than the year the program began while nonparticipants' usage was only 2.8% lower. This represents a 9.81 hour difference between the participants and nonparticipants which resembles the 9 hour difference found by Baun, Bernacki, & Tsai (1986). No dollar correction for inflation was calculated.

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 2). The null hypothesis was sustained.

One explanation for reductions in both groups 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.

3. Test of Hypothesis Three.

We analyzed employees' health insurance claims. The Town's health insurance carrier for the entire study period 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. However, family members were not included in this analysis.

Data from annual reports submitted by BC/BS were used to calculate the total number health insurance dollars used by the sample of employees for fiscal years ending 1987, 1988, 1989, 1991, and 1992. A 1990 report was not available. Each report listed the name of the person receiving health care; therefore,

family members were easily distinguished from employees and were not included in the totals.

An independent t-test analysis of 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.

As a practical matter, as seen in 1987, participants used an average of $175.94 fewer health care dollars than nonparticipants (Table 2). In 1988, the year the program began, there was a 65.0% increase in average expenditures by participants, exceeding the expenditure of nonparticipants by an average of $174.49. Gibbs, Mulvaney, Henes, & Reed's (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 ($307) from 1988 to 1989. Since that time usage has remained steady but has never declined to the pre-program level.

As Figure 2 indicates, health care expenditures by nonparticipants has continued to increase. In the first full year after the program was in place, 1989, participants' expenditures declined by an average of $307.20 while nonparticipants' expenditures 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, a 48.6% difference. This

figure approximates 45.7% reduction in health care costs reported by Bowne, Russell, Morgan, Optenberg, & Clark, (1984) and 48.2% reported by Baun et al., (1986).

Despite these differences, a two-way ANOVA indicated there was no significant difference between the amount of health care dollars spent by participation category or by year, nor any significant interaction between the two (Table 3). No dollar correction for inflation was calculated. However, if both groups continue in the same direction, a significant difference in health care costs may be achieved in the near future. Thus, this research suggests that worksite exercise programs should not be abandoned readily for lack of results since the benefits of exercise may not be exhibited for several years.

Focus Groups

To acquire a nonparticipants' perspective about exercise and the Be T.U.F.F. program, three focus groups were conducted. One focus group consisted of 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 such as they were too busy, didn't feel they has support from their supervisor, and exercising took time away from their families.

The other two focus groups held included employees who had never joined the Be T.U.F.F. program. When these employees were

asked if they believed exercise was important to their health, everyone said yes. When asked if they thought they got enough exercise, some stated they did not and others said they owned farms and felt they obtained enough exercise performing farm work after hours. In addition, others felt their jobs with 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.

Focus group results indicate that the Be T.U.F.F. program does not effectively reach non-participants with its requirement for aerobic exercise. Many have only 30 minute lunch breaks, have physically demanding jobs, do not have a flexible work schedule, or have farm work to do after hours.

Research Implications and Recommendations

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 appears to have begun to be successful in controlling the rate of increase of 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 adequate funding and personnel resources are committed

to allow operation of the program for several years because significant cost savings should not be expected immediately.

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 an exercise regimen.

To achieve greater participation in the program and aid in reducing sick days taken and health care dollars consumed, worksite exercise programs offered by local governments should carefully target lower income and less educated employees and make adjustments which would better accommodate them. Adding a component to the program which would incorporate exercise equivalents for employees who walk for hours reading water meters, who repair roads and water and sewer lines, or who perform other physical tasks would allow these employees to participate in the program.

Confounding Events/Artifacts

There are at least three factors which could have potentially affected the results of this study.

(1) When an employee has used all the sick time the Town has allowed 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 estimate of sick hours used by an 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 misrepresent exercise activities is possible. This would result in the employee being misclassified in the analysis.

(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 may have changed due to reasons unrelated to the exercise program or the work environment.

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, limitation of available evaluation measures and small sample size. In addition, the power of the single intervention

(exercise) may be too small to influence health care costs and sick leave taken.

Budget money allocated to continue the worksite exercise program in 1989 was $6,000. This amount was allocated for health club fees, incentive awards, health fair, and screenings for all employees and their immediate families. In 1990, the budget was reduced to $2,400, 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 to the Town is approximately $10.00 per full-time employee or $25 per enrollee (based on an enrollment of 81 employees in 1991). Thus, one way to evaluate the impact of an exercise program like this is that the Town recoups its investment in three employees for each sick leave day the program can avoid (if a sick leave day is valued at $82).

Continued and expanded evaluation of this preliminary investigation over the next few years is recommended as is assurance of program quality and the incorporation of measures to involve more blue collar workers. Also, the amount of health care dollars participants' and nonparticipants' family members spend should be analyzed to determine if the program has had any effect upon family members of participants.

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Table 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 2.

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)

Table 3.

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)

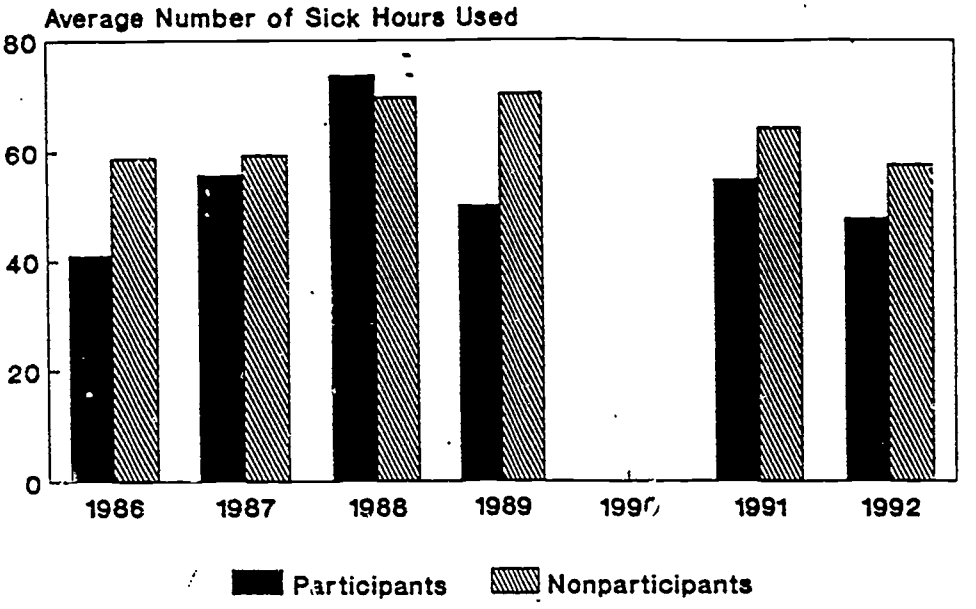

Figure 1 Average Number of Sick Hours Used By Participants and Nonparticipants Be T.U.F.F. Program, Town of Blacksburg

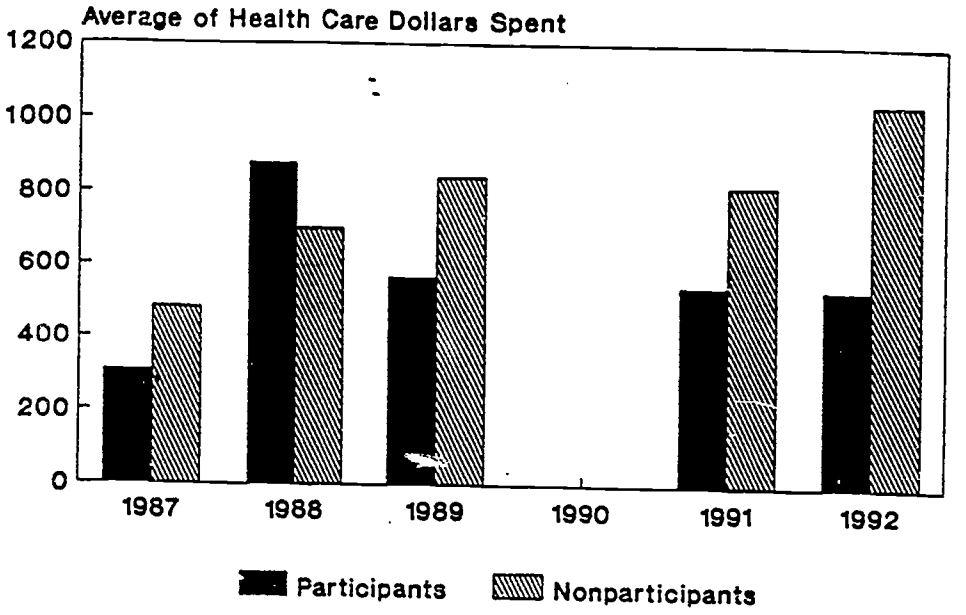

Figure 2 Average Amount of Health Care Dollars Spent By Participants and Nonparticipant Be T.U.F.F. Program, Town of Blacksburg