The Case for Health Promotion Programs Containing Health Care Costs: A Review of the Literature

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A review is conducted of major studies dealing with the impact of work site health promotion programs on health care costs. Inconsistent results were produced due to measurement, design, and sampling problems. A study of Blue Cross–Blue Shield of Indiana employees provided the best evidence of program-related health care cost reductions. Suggestions are made which, if implemented, should enable researchers to more confidently attribute cost reductions to health promotion program activities.

The term health promotion has gained wide popularity recently, and with this widespread usage has come a great diversity of definitions. In this article, health promotion is viewed as part of a broad spectrum encompassing all health services and activities. This spectrum consists of health promotion, health maintenance, and health restoration. Health promotion refers to all those activities that are aimed at apparently healthy individuals with the intent of helping them achieve maximum well-being. Health maintenance includes all activities aimed at apparently healthy individuals with the intent of keeping them healthy (i.e., avoiding disease). Finally, health restoration refers to activities aimed at ill individuals with the intent of restoring them to health. In many cases the studies that are reviewed, although referred to as work site health promotion programs, contain elements of all three categories of health activity.

Health promotion and occupational therapy have much in common. The economic climate of our nation’s health care system necessitates a close scrutiny of the use of all ancillary services as a method of cost containment. Health promotion programs have come under such scrutiny, as hospitals, health maintenance organizations (HMOs), insurance companies, and other vendors of health services attempt to develop long-term strategies to complement their short-term, competitive, cost-dominated care delivery.

Short-term, efficiency-based service delivery will not always be to the advantage of the people served; nor will it be the most cost-effective. If patients are discharged from hospitals earlier but return more often because their problems have not been fully addressed, overall health care costs will be affected. Likewise, short-term strategies in health care cost containment may shift the cost to other programs rather than actually containing them.

To the extent that work site health promotion programs are thought to reduce health care costs, they may be introduced in an attempt to lower health care utilization and to reduce costs and copayments that might be passed on to employees. A vast literature has accumulated ostensibly supporting the belief that work site health promotion programs can guarantee economic benefits for employers. In fact, more attention has been given to health care costs than any other outcome variable, but few rigorous studies have reported the effects of health promotion programs on health care costs (Terborg, in press). Recent studies of work site health promotion programs are reviewed here focusing on their success in reducing health care utilization and costs.

This review is restricted to the more rigorous studies where attempts were made to control for factors that could confound the obtained results. For example, there are many descriptive studies where
one cannot attribute observed effects to the existence of a specific program (Fielding, 1984b; Knobel, 1983; Rentmeester, 1984). A decrease in cigarette smoking during the course of a smoking cessation program, for example, cannot be confidently attributed to the program without data from a control group that has not been exposed to the program. In addition, many descriptive studies are based on estimated savings rather than actual savings (Kristol, 1977; Scheffler & Paringer, 1980). To accurately predict health care cost savings, one should have real cost data rather than cost projections based on a model that may not take into account crucial factors.

The Prudential Study

Bowne, Russell, Morgan, Optenberg, and Clarke (1984) examined major medical and disability costs in a study of Prudential's Houston office employees. Employees were involved in a work site fitness program including a physical examination, periodic screenings, and classes in aerobic dancing, calisthenics, jogging, weight control, smoking cessation, prudent diets, alcoholism prevention, and stress management. The participation rate was low (19%). Baseline data for the year prior to the study were compared to those for the year after entry into the program.

Results showed that the higher the level of employees' fitness, the lower were the major medical and disability costs. Counter to the trend for all employees of increasing payments over the previous 4 years, there was a 45.7% decline in major medical costs and a 31.7% reduction in disability costs. The authors estimated savings of $1.93 for every dollar invested in the program.

One of the strengths of this study is that it was a prospective, longitudinal evaluation of the effects of a health promotion program on two measured cost outcomes. Unfortunately, several problems with this study limit its usefulness in attributing cost savings to health promotion programs. These include selection bias (the probability that the participants in the study were not representative of the employee population), a noncomparable control group, and a lack of a mechanism for monitoring adherence to the fitness program.

Canada Life and North American Life Study

Shephard, Corey, Renzland, and Cox (1982) examined cost data on hospital admissions and four categories of medical claims (ECG, obstetric, orthopedic, and other) for a sample of two Canadian insurance company employees 1 year prior to and the year of instituting a fitness program at the test company. At the control company, a similar fitness program was promised but not implemented until 1 year after program completion at the study company. The fitness program consisted of up to three 30-minute sessions per week of both rhythmic calisthenics and endurance-type activity supervised by a health professional. In addition to the fitness facility and program, other aspects of personal lifestyle were publicized by periodic lectures, columns in company magazines, and mailings to employees.

In the year prior to the fitness program, average days of hospital care were higher for the experimental company (mean = .27) than for the control company (mean = .13). But a year after the implementation of the fitness program, this was reversed so that the mean for the experimental company was .09 and the mean for the control company was .51. The difference between companies using postprogram data was statistically significant based on a modified t test ($p < .05$).

A different pattern emerged after examination of medical claim costs. The costs for the experimental and control companies were virtually identical for the year prior to the fitness program (mean = $84.20 per employee per year for experimental vs. $84.50 per employee per year for control). However, after program implementation, the control company increased to $113.70 while the experimental company remained at $85.00. The difference between companies in the second year approached statistical significance ($p < .10$).

More detailed analyses were conducted within the test company. Prior to starting the program, participants in the fitness program had less hospital care than nonparticipants, and both groups declined in hospital care following implementation of the fitness program. Neither group experienced a significant decrease in the total cost of medical care during that same period.

As was the case with the study by Bowne et al. (1984), this study was an early attempt at evaluating the cost impact of a health promotion program via a prospective longitudinal methodology incorporating a control group. An additional strength of this study was that medical costs and participation levels were broken down into components allowing for more precise analyses. It is possible to identify the potential effects of levels of participation on hospital days and costs.

Unfortunately, participants and nonparticipants at the test company showed no significant change in health care costs during the test period. Additionally, any advantage to the test company in medical care costs was seen primarily in an increase in costs for controls rather than a decrease for fitness program participants. The authors concluded that these results were due to a cost containment effect in the test company, presumably brought about by a general increase in health awareness. An alternative explana-
tion is that the utilization behavior of the sample of employees within the control company was aberrant.

The Tenneco Study

Baun, Bernacki, and Tsai (1986) drew a random sample of employees in two Tenneco divisions (N = 517 employees) to determine the effect of a corporate fitness program on absenteeism and health care costs after the first full year of operating a health and fitness program. The health and fitness program offered aerobic, calisthenic, and health promotion classes. Program participants recorded their fitness activities both inside and outside the exercise facility on a computer terminal. For purposes of the analysis, three categories of factors were considered: sex (male, female), age (younger than 35 years, 35 to 54 years, 55 years of age and older), and exercise activity (no recorded activity, recorded activity). Health care costs were all monies paid to health care providers by Tenneco's group health insurance company for ambulatory and hospital care.

Total health care costs among exercisers were lower (male $561, female $639) than among nonexercisers (male $1,003, female $1,535). These differences were not statistically significant due to the large variation in individual costs. When the authors looked at ambulatory costs, they found that nonexercisers' costs were significantly higher (p = .05). The authors could not explain the higher nonhospital claim costs among younger and older exercisers except that a disproportionately higher number of older males with chronic cardiovascular problems used the center during the study period.

This analysis is an example of a careful study of the differences between exercisers and nonexercisers in health care costs during the operation of a worksite health and fitness program. However, since almost 50% of Tenneco employees claimed to be regular exercisers before the program was initiated and 60% of the current program participants claimed to be regular exercisers before joining the program, self-selection precludes attributing a reduction in health care costs to program effects. Of course, as the authors point out, one of the arguments favoring the establishment of an exercise facility can be that it will attract and retain employees who are more likely to have positive work and health behaviors and these benefits can be realized immediately.

Blue Cross–Blue Shield of Indiana Study

Data were drawn from the Blue Cross–Blue Shield of Indiana (BCBSI) employee health promotion program between January 1978 and September 1982 (Gibbs, Mulvaney, Henes, & Reed, 1985). The program offered group education for nutrition, weight reduction, smoking cessation, and fitness after risk screening by questionnaire and physiologic measurement. Participants and nonparticipants were compared in each of seven time periods on the number of claims and dollars paid per person for ambulatory and in-hospital procedures. In all of the comparisons, participants were defined as those screened during a particular period. Nonparticipants were all others who also were employed for the duration of the period but had not been screened through that period.

Results indicated that participants averaged more claims and higher payments than nonparticipants in almost all comparison periods. A possible explanation for this result is that the screening process initially increases use. The authors then followed a smaller cohort for almost 5 years after the program. Overall, payments per participant were 76% of those of nonparticipants (Gibbs et al., 1985, p. 829). The imputed reduction in health care costs per participant was $519.09. When this was expressed for all employees rather than the cohort, the savings per employee became $143.60. The ratio of the 5-year reduction in health care costs to program costs per employee was 1.15 ($143.60/$126.86).

In this study of BCBSI employees, several years of postprogram data are collected for both test and control subjects, thus overcoming a major limitation to the studies of Bowne et al. (1984) and Shephard et al. (1982). Despite a few design shortcomings (self-selection, few males, short preprogram baseline), the results do support the notion that work site health promotion programs pay off after an initial period of increase in costs.

Several other major studies have not yet produced published health care cost results but are noteworthy for their design and the potential of their results. Among these are studies by Blue Cross of California, AT&T, Johnson and Johnson, and Control Data Corporation, which are reviewed below.

Blue Cross of California

A health education program called "It's Your Choice" was designed to help employees make more informed decisions about when to seek professional medical care at the physician's office or emergency room. The program was offered to 22 California employers, and a total of 5,200 employees attended a presentation, received self-help books, and completed self-administered questionnaires. Outpatient visits were reduced by 17% or 2.0 visits per household per year (Lorig, Kraines, Brown, & Richardson, 1985).

AT&T

The effects of a pilot health promotion program were evaluated, consisting of a health risk assessment (HRA) and health education modules on fitness, re-
duction of backache, weight control, stress management, smoking cessation, cholesterol reduction, cancer screening, nutrition, and interpersonal communication. A study group was given a health risk assessment and offered the health education module. One control group was given the HRA but offered no modules; a second control group was neither given the HRA prior to the program nor offered modules. Study group employees showed greater overall improvements than control group employees in their exercise levels, in their ability to stop smoking, in their perceptions of their own health, and in reducing their amount of Type A behavior. The risk of heart attack in the next 10 years was significantly reduced for the total study group (Spilman, Goetz, Schultz, Bellingham, & Johnson, 1986).

Johnson and Johnson
The “Live for Life” program is a major corporate health promotion program consisting of a health screen, a life-style seminar, and life-style improvement programs such as smoking cessation, exercise, stress management, nutrition, weight control, and general health knowledge. A 2-year quasi-experimental non-equivalent control group epidemiological study was designed to assess the impact of the program on biomedical data, life-style, job performance, general attitudes, turnover, absenteeism, and health care costs. Four companies received the comprehensive “Live for Life” program, and five companies received only an employee health screen. Preliminary evidence after 1 year of the program clearly suggests that the treatment cohort, in comparison with controls, consistently showed greater improvements in the major health and life-style areas addressed by the “Live for Life” program. Specifically, statistically significant differences were observed in fitness level, weight control, smoking cessation, stress management, and reported employee attitudes about work (Fielding, 1984a; Wilbur, 1983).

Control Data Corporation
Since 1979 Control Data Corporation’s Staywell program has been offered to CDC employees and more recently to employees of other corporations through a network of hospital distributorships. The program consists of an employee health survey, individual health risk profiles, risk reduction courses, and long-term social support to encourage the maintenance of life-style changes.

At present, data are limited to self-reports of changes in health status and behavior. Participants in courses on smoking cessation, exercise, weight control, stress management, and nutrition report statistically significant improvements compared to nonparticipants regardless of whether or not they received a health risk appraisal (HRA) at study locations.

A 10% sampling of all employees on norms surrounding maintaining proper body weight, smoking, diet, physical fitness, stress management, energy level at work, alcohol use, and coffee consumption was conducted. Employees at study locations, regardless of whether they participated in the Staywell program or not, reported statistically significantly greater change than did employees at control locations on all of the above variables except alcohol use and coffee consumption. These two variables were included in the survey as a method check, since the Staywell program did not address either of these two behaviors (Jose & Anderson, 1986).

Discussion
Studies reviewed here, with the possible exception of the BCBSI study, have not yet produced incontrovertible evidence that health promotion programs produce decreases in employee health care costs. In order to develop this evidence, it would be necessary for certain conditions to exist:

- Random assignment of subjects to treatment and control conditions or appropriate quasi-experimental designs that will maximize the internal validity of the study;
- Linkage of individual health status and utilization data;
- Statistical control for differences between participants and nonparticipants in programs;
- Statistical control for the changing health trends in the general population;
- Identification and elimination of plausible competing explanations for program effects;
- Lengthy observation periods in order to identify time-lagged cost effects;
- Recruitment of large enough samples to negate loss due to employee turnover;
- Training of employees to accurately monitor and report their health utilization and health behavior;
- Total and component analyses of health promotion programs (e.g., health risk appraisal vs. health education interventions) on health care utilization;
- Breakdown of health care cost data into types of services used;
- Appropriate use of multivariate statistics to examine potential interaction effects among employee characteristics, program components, and the worksite environment; and
- Separate analyses to measure the effects of the worksite program on the family and its consequences for reduction in company health care costs.

A full cost-benefit study of an employee health promotion program requires the analysis of ambula-
tory, hospital, and disability claims as well as effects on employee absenteeism and productivity. Rarely are the implications of improved health on retirement benefits and longevity addressed. At this early stage in the evolution of analyses of the effects of health promotion programs on health care costs, it is interesting to note inconsistencies in findings.

Shephard et al. (1982) found improvements in both participants and nonparticipants in a health promotion program, while Bowne et al. (1984) found improvements limited to program participants. Gibbs et al. (1985) also found initial increases in health care costs, whereas Bowne et al. (1984) found a large 1-year reduction in health care costs in program participants. There are also differences across studies in measurement and design methodology and organizational variables, which make a combining of program results difficult. Taken together, these studies have not resulted in common explanations for the mechanism by which work site health promotion programs have produced their cost reduction effects. It is hoped that studies currently in progress in major corporations will remedy this situation.

Occupational therapists are currently facing many of the same problems that health promotion professionals are facing, including the need to justify the cost of their programs. As length of stay decreases, the practice patterns of occupational therapists are changing from hospital settings to intermediate care and home settings. This, in turn, has led to their rehabilitation work coming under more careful scrutiny by third-party payers and utilization review programs. Such circumstances will increasingly require occupational therapists to demonstrate the functional relationship between intervention parameters such as type, length, and intensity of treatment on the one hand and functional change in the client on the other. Assuming such demonstrations, additional research will be required to determine whether occupational therapy is more cost-efficient in producing therapeutic effects and subsequent early return to work than are alternative approaches. In the final analysis, the occupational therapist is working in the same cost containment climate as the health promotion professional and would be well advised to learn from the experience of work site health promotion programs.

References


