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With rapidly rising health care expenditures, health care cost containment has become a major issue facing this nation. A phenomenal growth in worksite health promotion has occurred with the recognition that these programs have the potential to reduce these costs. However, to be effective as a cost containment strategy, health promotion programs must successfully attract participants, particularly those whose health is most at-risk. Due to limited research on issues of participation, there is a need to investigate the characteristics of individuals attracted to worksite health promotion programs and the factors that influence their participation.

The purpose of this study was to explore the characterization of participants and nonparticipants and to examine the factors that influence participation in health promotion programs. A self-selected participant group (n=173) was compared to a nonparticipant group (n=146) with respect to sociodemographic characteristics, health care costs, health status, and health risk behaviors. Qualitative and quantitative data were collected from the employer's records and from a questionnaire designed to address specific components of the program.

Results indicated that management/administrative staff were more likely to participate in the health promotion program than were classified or faculty staff. For the period of the survey, participants were also more likely to be nonsmokers and were less likely to be injured on-the-job during one of the survey years. The workers' compensation claims costs for nonparticipants were significantly higher in one survey year and over the two-year average period considered. However, the nonparticipant claims were strongly influenced by one costly claim in 1988. The two groups did not differ when the absenteeism data from the employer's records were analyzed.

In addition, it was found that subjects with the highest levels of participation also had the fewest number of children living in the household. Time constraints as a result of job schedule, work/activity load, and meeting times of the activities were the most important factors limiting participation in the program.

Further research is needed to assess program effectiveness and program impact upon employee health and health care costs. The analysis should be conducted over a longer period of time and comparisons should be made within as well as between groups.

Comparative Analysis of Factors Influencing Participation in an Employee Health Promotion Program, Including Characterizations of Participants and Nonparticipants

by

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CHAPTER 1

INTRODUCTION

> Many believe that health care costs in the United States are now out of control. Causes are complex; solutions are difficult. Nevertheless, the issue cannot be ignored. (Berger, 1992)

Introduction to the Problem

Spiraling health care costs in the United States pose a major problem for modern businesses. Rising from $27 billion in 1960, to $74 billion in 1970, and to $666 billion by 1990, national health care expenditures have skyrocketed (Cohen, 1985; Jacobson, Yenney, & Bisgard, 1990; Ostwald, 1986; Terborg, 1986; Urling, 1992). By 1990, health care spending had increased to no less than 12.3 percent of the Gross National Product (GNP), expendutures that are expected to rise at an average annual rate of 10 to 14 percent during the next five years (Jacobson et al., 1990). Approximately 30 percent of this bill is paid by business and industry, primarily through the provision of employee health benefits (Conrad, 1988b; Terborg, 1986). The annual cost of these health benefits to employers is more than $60 billion annually, representing an increase of more than 500 percent in just the last 10 years (Ostwald, 1986).

Health care costs to businesses have not been limited to the provision of employee health benefits since employee health behaviors serve to add to insurance-

related costs. The U.S. Centers for Disease Control have determined that 48.4 percent of all American deaths were a result of individual lifestyle behaviors (Sciacca, 1987). Such behaviors as smoking, dietary choices, lack of exercise, and the use of alcohol are associated with the increased risks of cardiovascular disease, cancer, stroke, accidents, and chronic obstructive pulmonary disease. Terborg (1986) has stated that lifestyle behaviors contribute to approximately 52 percent of the mortalities resulting from the 10 leading causes of death. These types of employee illnesses have resulted in substantial costs to industry from decreased productivity, lost days, turnover, on-the-job accidents, workers' compensation expenses, disability payments, and other forms of health benefits as well as the direct costs of medical treatment (Fielding, 1984).

As the number one health risk behavior in the U. S., smoking-related illness has been reported to cost corporations approximately $23 billion each year. Inasmuch as smokers have been shown to have higher absenteeism rates and to experience higher rates of accidents at work, costs for lost productivity have been estimated to cost $30 billion annually (Adams, 1988; Fielding, 1984). In addition, alcohol and drug abusers are three times as likely to be tardy, use three times as much sick leave, make five times as many workers' compensation claims, and have 3.6 times as many accidents as non-users.

According to Boden, Johnson, and Smith (1992), medical cost containment is a major challenge facing the modern workers' compensation system. The U.S. Bureau of Labor Statistics reported that the rate of work injuries and illnesses per 100 workers in the private sector rose from 7.6 in 1983 to 8.6 in 1989. In 1990, 1.8 million disabling work-related injuries were sustained in the United States, at an overall cost to society of $63.8 billion (National Safety Council, 1991).

In the increasingly competitive global economy of the last decade, these rising health care costs have become a major handicap for American businesses, prompting

managers to examine alternatives that have the potential to contain or manage these costs. "Today, health care cost containment is *the* issue that cuts across the business community at large, as well as politics, government, medicine, the insurance industry, and labor organizations, to name just a few affected sectors of society" (Scofield, 1990, p. 864). Corporate managers have been attracted by the potential cost containment benefits that health promotion programs offer. The National Association of Insurance Commissioners (1990) has predicted that increased awareness of the importance of wellness and healthy lifestyle behaviors will be one of the major developments that will dominate the evolution of cost management strategies over the next few years.

Employee health promotion programs are based on the assumption that employees' daily lifestyles, with respect to exercise, eating, smoking, and stress management, will directly impact their present and future health, the quality of their lives, and their job performances (Nathan, 1984). The National Association of Insurance Commissioners (1990) has stated that "a healthy insured population will utilize fewer expensive medical care services as a result of fewer preventable deaths, accidents and illnesses" (p. 9). Thus, worksite health promotion programs have the potential to impact absenteeism, health care claims, disability claims, turnover, and employee health risks, as well as improvements in work attitudes, worker health, and quality of life. These programs are also believed to enhance the corporate image, serving to improve employee morale and job satisfaction with their resultant effects upon increased productivity (Terborg, 1986).

However, it is typical that health promotion programs face a struggle with recruitment and must continually seek to reach nonparticipants in the effort to improve employee participation. Fielding (1982) found that participation rates for onsite programs varied from 20 to 40 percent, while offsite program participation dropped to between 10 to 25 percent. When compounded by high program drop-out

rates, the result has been poor long-term participation levels. Spilman (1988) has emphasized that if worksite health promotion programs are to realize their potential benefits for employees and employers alike, they must effectively recruit participants, particularly those whose health is most at risk. This ability to attract and to involve participants is an often overlooked factor in program success.

Significance of the Study

As previously discussed, employee health promotion programs have the potential to affect health care cost management through reductions in absenteeism, health care claims, on-the-job injuries and illnesses, and reduced employee health risks. However, effective employee participation in these programs is requisite to the realization of these benefits.

In view of the fact that research in this area has been limited in extent, there is a demonstrable need to explore participant characteristics as well as those factors associated with participation in employee health promotion programs. With greater understanding of participant characteristics, as well as those factors that may serve to hinder participation, programs can more effectively recruit as well as retain program participants. To the degree that participation and adherence may be improved, the potential benefits of worksite health promotion programming as a cost-containment strategy and as a mechanism for health risk management can be more effectively realized.

Purpose and Objectives of the Study

The purpose of this study was twofold: 1) To analyze those factors and characteristics which may be associated with participation and adherence; and 2) to explore differences in health status and health care costs between participants and non-

participants in a worksite health promotion program.

The objectives of the study were:

1) To review the literature related to participation and the benefits of participation in employee health promotion programs;
2) To compare health costs for program participants and nonparticipants from records of absenteeism, health insurance claim records, and workers' compensation claim records;
3) To design and administer a questionnaire to derive data on program participants and nonparticipants for comparisons in the areas of:
    a) health risk behaviors, including smoking, alcohol use, physical activity, and eating habits;
    b) health indicators, including absenteeism, health status, job satisfaction, job stress, and weight;
    c) factors influencing participation, including psychological and physical factors;
    d) the effect of the program on perceived acquisition of health information, perceived increase in health risk awareness, and selected behaviors;
    e) major health concerns; and
    f) selected sociodemographic factors, including job classification, marital status, total family income, and number of children;
4) To determine if differences exist between questionnaire respondents and nonrespondents for selected sociodemographic variables; and

Research Questions

The following research questions were considered for this investigation:

1. Can the physical and psychological factors that may influence participation in an employee health promotion program be identified and described?
2. Can it be determined if an employee health promotion program reportedly impacts selected health behaviors and/or the perceived acquisition of health information and increased awareness of health risks?
3. What are the most significant personal health concerns or problems identified by participants and nonparticipants in an employee health promotion program?
4. Are there significant differences between participants and nonparticipants in an employee health promotion program with respect to selected sociodemographic, health care cost, reported health risk behavior, and/or health indicator variables?
5. Are there significant differences between respondents and nonrespondents to a personal health inventory tailored to the issue of the effectiveness of an employee worksite health program with respect to sex, age, job classification, or participation category?

Hypotheses

The following statistical null hypotheses were tested for this study:

Ho_1 There will be no significant differences between employee health promotion program participants and nonparticipants for selected sociodemographic variables.

Ho_2 There will be no significant differences in health care costs between employee health promotion program participants and nonparticipants.

Ho_3 There will be no significant differences between employee health promotion program participants and nonparticipants for selected health risk behavior variables.

Ho_4 There will be no significant differences between employee health promotion program participants and nonparticipants for health indicator variables.

Ho_5 There will be no significant differences between questionnaire respondents and nonrespondents for selected sociodemographic variables.

Ho_6 There will be no significant differences between inactive and active subjects for selected health care costs or health risks, or for selected health indicator variables.

Limitations of the Research

There is a potential limitation in relation to the definition of each level of participation in the employee health program selected for review in connection with this study. Participant criteria were limited to participation in the incentive program, personal health assessment procedures, and staff aerobics, as determined by the employers' records. An individual was classified as a participant if he/she had participated in at least one of these activities. Educational workshops were also part of the health promotion programming. However, because records of attendance were not maintained, attendance was not included in the participant criteria. As a result, subjects defined as nonparticipants may have attended the workshops in question. It may also be assumed that the promotional campaigns conducted and the health materials distributed at the selected worksite increased health awareness among both

participants and nonparticipants. For example, a health newsletter was distributed to all employees at no charge. As a result of these two program features, some program effects may have diffused to those otherwise categorized as nonparticipants.

Nonparticipants may also have been activitely involved in activities outside of the workplace, or exercised on their own to a degree equal to or greater than program participants. At the same time, they may not have recorded and/or submitted exercise hours for purpose of program incentives. To attempt to control for this variable, each subject was asked how often he/she exercised aerobically for durations of at least 20 minutes, and whether or not he/she obtained this exercise through an organized program.

Self-reported fitness hours reported for purpose of program incentives introduced another possible bias. If times were not recorded immediately upon completion of exercises, an overestimation or an underestimation of fitness hours may have occurred. However unlikely, it is also possible that an inactive individual could have submitted false information to earn incentives and thus have been categorized inaccurately as a program participant.

The self-selection of participants presented another potential limitation and bias. The purpose of this study was to explore differences between program participants and nonparticipants as well as the characteristics that further defined these groups and exercised an effect upon program participation. It has previously been indicated that those who participate in health promotion programs are generally healthier at the onset rather than healthier as a result of program effects (Conrad, 1987, 1988a; Fielding, 1982, 1984). In the absence of baseline data, it was not possible to determine if the differences in levels of health were due to effects of the program or to a continuation of preexisting differences.

Another limitation involved absenteeism data obtained from employee records. The employee records did not differentiate between sick leave for personal illness, a

sick child, relative, or spouse/significant other, or a mental health day. Therefore, it was impossible to determine the degree to which absences, if any, were due to the personal illness of subjects. To further define this information, survey questionnaire respondents were asked to break down their sick leave taken by personal illness, a sick child, sick relative, or sick spouse/significant other, and/or a mental health day.

There was a possible nonresponse bias in relation to the collection of socio-demographic data, health cost data, and participant classifications from employee records for all subjects mailed the questionnaire. However, results from the questionnaire data cannot be generalized to the nonrespondent population.

Definition of Terms

The following terms are defined to clarify their use in this study:

Absenteeism: The total number of recorded "sick leave" hours used during the calendar years 1988 and 1989.

Active subject: Subject who engaged in aerobic activities at least once per week.

Classified staff: Support staff including clerical, secretarial, physical plant, and food service employees, or similar positions.

Compensable claim: A claim due to an accidental injury arising out of and in the course of employment and which requires medical services and/or results in disability or death.

Exempt staff: Supervisory and management positions.

Faculty: Instructional staff.

Health insurance claim data: All monies paid to health care providers per person by the employer's health insurance carrier during the year 1989.

Inactive subject: Subject who rarely or never engaged in aerobic activity.

Job classification: Classified, faculty, or exempt salaried staff.

Nonparticipant: A full-time salaried employee who was employed for the entire year 1988 and/or 1989 (i.e., at least one of the study years), and who did not participate in the Health Risk Assessment, Incentive Program, or staff aerobics during 1988 and 1989.

Participant: A full-time salaried employee who was employed for the entire year 1988 and/or 1989 (i.e., at least one of the study years), and who participated in the Health Risk Assessment, Incentive Program, and/or staff aerobics during 1988 and/or 1989.

Occasional Participant: A participant who did not participate regularly.

Regular Participant: A participant who earned an incentive during at least one of the study years and who participated in staff aerobics during 1988 and 1989; or if employed for a single year, a participant who earned an incentive for that year.

Questionnaire respondent: Subject of this investigation who completed and returned the survey questionnaire.

Sick leave: Absence due to illness.

Workers' compensation claim data: All monies paid to health care providers per person by the employer's compensation insurance carrier for compensable claims during the calendar years 1988 and 1989.

CHAPTER 2

REVIEW OF THE LITERATURE

This study was designed to compare employee health promotion program participants and nonparticipants with respect to sociodemographic characteristics, health status, health risk behaviors, health care costs, and specific psychological variables. Factors influencing or limiting participation were also examined. The literature relating to these comparisons is reviewed in this chapter.

The first section includes an overview of the history and current status of worksite health promotion programs. This is followed by a review of the literature concerned with the rationale for these health promotion programs. In this second section, focus is upon program benefits in terms of their impact on health care costs, health risk behaviors, and health indicators. The third section reviews those factors associated with or influencing participation, including an examination of participant characteristics as well as physical and psychosocial influences upon participation. Within this context, three major psychosocial constructs of health behavior are described, including locus of control, the Health Belief Model, and self-efficacy.

Origins and Current Status of Worksite Health Promotion Programs

According to Pencak (1991), "consciousness about wellness has exploded in the workplace arena since the mid-1970s" (p. 233). Much of the impetus for this rapid growth in the promotion of employee health programs originated from the 1973 report from the President's Committee on Health Education (U.S. Department of Health, Education and Welfare, 1973), which concluded that the workplace was a

good place to reach many adults with health information. The report also stated that employees who practiced preventive health behaviors were assets to themselves as well as to their employers. Further momentum was provided by the report of the U.S. Surgeon General (1979) on health promotion and disease prevention, or the "Healthy People" report, which established broad goals addressing individual responsibility for health as well as necessary environmental and social supports.

Cohen (1985) cited several factors supporting the workplace as the ideal setting for health promotion programs, and stated that they would "contribute to greater participation in health promotion programs as well as greater success in changing health habits and attitudes" (p. 215). These included:

1) Regular work attendance facilitates regular participation;
2) Social support and reinforcement can be gained from contact with co-workers and from supportive management;
3) The workplace offers opportunities for environmental supports of healthy behaviors; and
4) These programs in the workplace are convenient and can be offered at low cost.

Thus, the increase in the number of worksite health promotion programs has been noted in a number of studies. The first National Survey of Worksite Health Promotion Activities, which targeted private sector worksites with 50 or more employees, found that approximately 65.5 percent of the sites surveyed had one or more areas of health promotion activity (Fielding, 1989). The most frequently cited activities were (in order of importance): 1) smoking control, 2) health risk assessments, 3) back care, 4) stress management, 5) employee assistance programs, 6) exercise/fitness programs, 7) off-the-job accident prevention, 8) nutrition education, 9) high blood pressure control, and 10) weight control. Of these 10 principal activities, 52 percent had been initiated within just the five years previous to

the survey. Programs ranged in diversity from a single intervention to comprehensive health promotion programs.

Respondents in a recent study by Barker and Glass (1990) indicated that their top three topics of interest were stress, fitness, and nutrition. Younger employees were interested in pregnancy, family planning, parenting, premenstrual syndrome, first aid, and nutrition issues. Hollander and Lengermann (1988) assessed the nature and extent of health promotion programs among "Fortune 500" companies and the results indicated a high level of health promotion activity. Two-thirds of the "Fortune 500" companies had worksite programs and the remaining one-third planned to initiate programs in the near future.

The evolution and growth of worksite health promotion has resulted in a diversity of definitions. This program area is generally viewed as a part of a broad spectrum encompassing all health services and activities (Elias & Murphy, 1986). Terborg (1986) described it as "an ongoing series of activities funded or endorsed by the organization that are designed to promote the adoption of personal behavior and corporate practices that are conducive to employee fitness, health, and wellness" (p. 225). According to Everly (1985), health promotion may be defined as any intervention designed to facilitate personal health maintenance or improvement behavior.

Green and Lewis (1986) provided one of the most widely accepted definitions of worksite health promotion, describing it as any combination of educational, organizational, economic, and environmental support for behavior conducive to health. It has been determined that socioeconomic forces and environmental conditions within both the workplace and the home are major influences upon lifestyle behavior decisions and the subsequent determinants of health (Castillo-Salgado, 1984). Therefore, workplace health promotion must encompass an individually-based lifestyle approach as well as an environmental-social approach. As examples, this includes such factors

as financial support and rewards, work structure and organization, and the reduction of hazardous and stressful working conditions, each of which provides workers with a sense of control exercised through a team approach, as well as flexible program scheduling.

An environmental-social approach to health promotion recognizes that long-term illness and injury loss control is not solely the product of a technologically safe environment. According to Opdyke and Thayer (1987), "the prevention of losses requires the needs of the workers and the task be considered collectively" (p. 38). The control and reduction of losses occurs through an integration of the technical system of work design and the social system of worker attitudes and expectations, an ergonomic focus which is critical to long-term loss control. Keyserling (1988) defined ergonomics as the study of people at work directed at the understanding of the complex relationships among people, the physical and psychological aspects of the work environment, job demands, and work methods.

Opdyke and Thayer (1987) stated that a build-up of stress will occur among workers when the social and technical variables are inadequately matched, resulting in increased risk. An injury or illness may result from the inability of workers to cope with increased stress. The National Safety College of Insurance and the National Institute for Occupational Safety and Health have estimated that 75 to 85 percent of all industrial accidents are caused by the inability to cope with stress and conflict (Schilling, 1989). The cause of this stress "may lie in the way the organization is managed, its leadership style, degree of worker participation, and level of fulfillment" (p. 685).

Worksite health promotion encompasses educational components, as well as organizational and environmental supports, for the promotion of healthy behaviors. According to O'Donnell (1986), health promotion programs can be implemented at three levels. Level I programs increase awareness of healthy behaviors and the

consequences of unhealthy practices, but they may not necessarily result in behavioral changes. Typically, this approach includes health fairs, newsletters, posters, flyers, health screening, and/or educational classes. Level I programs are intended to generate interest in health promotion activities, whereas Level II programs use a variety of strategies to induce lifestyle behavioral changes. These strategies include health education or fitness programs, usually from 8 to 12 weeks in length. At this level, behavior modification techniques are incorporated to affect long-term behavioral changes. Finally, Level III programs provide environmental support for sustained healthy lifestyle behaviors. A supportive environment may include fitness facilities, organizational policies that promote a healthy workplace, healthy food choices, and/or a smoke free workplace.

Katz and Showstack (1990) emphasized that comprehensive, broad-based programs are more likely to be successful in reducing health care costs than single-intervention programs. They described a comprehensive approach as one that includes "traditional health promotion efforts as well as corporate culture modifications, disability management, safety and health protection, risk management, benefits design, and human resource policies" (p. 849). This type of comprehensive approach is more likely to yield lasting changes.

Rationale for the Establishment of Worksite Health Promotion Programs

The most frequently cited rationale for health promotion programming is its use as a cost-containment strategy. Business and industry pay approximately 30 percent of the escalating national health care bill. This cost to employers is over $60 billion annually, and has increased by more than 500 percent in just the last 10 years (Ostwald, 1986). Research continues to accumulate evidence supporting the belief that worksite health promotion programs can effect economic benefits for employers

(Baun, Bernacki, & Tsai, 1986; Bly, Jones, & Richardson, 1986; Bowne, Russell, Morgan, Optenber, & Clarke, 1984; Breslow, Fielding, Herrman, & Wilburl, 1990; Cady, Thomas, & Karwasky, 1985; Gibbs, Mulvaney, Henes, & Reed, 1985; Shephard, Corey, Renzland, & Cox, 1982, 1983; Wood, Olmstead, & Craig, 1989). Reported benefits include increased employee morale, improved corporate image, increased employee productivity, improved employee health, reduced absenteeism, reduced turnover, reduced on- and off-the-job accidents, reduced time lost from work due to illness and injury, reduced utilization of medical facilities, reduced medical costs, and reduced workers' compensation costs (Terborg, 1986). For example, Coors' comprehensive health promotion program has been estimated to save the company at least $1.9 million annually in reduced medical costs, sick leave, and increased productivity. It was determined that every dollar spent on health promotion brought a return of $6.15 (Caudron, 1990).

The second rationale is situated in the lifestyle-risk factor paradigm in medicine, as described by Conrad (1988b). The basic assumption underlying this paradigm is that individual lifestyle behaviors or risk factors are key to the development of chronic disease. Conrad observed that scientific evidence supporting this assumption has been derived from three studies: 1) the 1964 U.S. Surgeon General's "Report on Smoking," which associated the development of lung cancer with cigarette smoking; 2) the "Framingham Heart Study" of 1952, which linked cholesterol, smoking, and hypertension with the risk of heart disease; and 3) the 1965 "Alameda County Study," which related specific behaviors to health status and longevity. Spilman, Goetz, Schultz, Bellingham, and Johnson (1986) were in agreement that this body of research has continuously demonstrated that lifestyle behaviors have an important effect upon health.

Participation in health promotion activities has been shown to improve health status and to reduce risks through the adoption and maintenance of healthful

lifestyle behaviors (Anderson & Anderson, 1991; Blair, Collingwood, Reynolds, Prentice, & Sterling, 1986; Evans, Harris, McNeil, & McKenzie, 1989; Fielding, 1984; Kronenfeld et al., 1987; Spilman et al., 1986; Wood et al., 1989; Yang, Lairson, Frye, Nerd, & Falck, 1988). The range of this type of evidence has been used by corporate managers to justify financial investment in health promotion programs (Pencak, 1991).

Health Promotion Program Benefits

Well planned and implemented programs can benefit participants and their companies, as well as the health care industry. According to Gebhardt and Crump (1990), these benefits are "expressed in terms of reduced health care costs, injuries, turnover, and absenteeism, as well as increases in job performance and morale" (p. 265).

Program Impacts Upon Health Care Costs

In the review conducted by Gebhardt and Crump (1990), it was stated that the preliminary results obtained from a number of long-standing programs "indicate that fitness and health promotion programs are successful in promoting healthy life-styles and are beginning to demonstrate cost effectiveness in relation to health care costs" (p. 265). Reductions in health care costs result from lower rates of absenteeism, turnover, and job-related injuries.

The literature provides substantial evidence that participation in employee health promotion programs can serve to reduce absenteeism (Bertera, 1990a; Blair, Collingwood, Reynolds,Prentice, and Sterling, 1986; Conrad, Riedel, & Gibbs, 1990; Cox, Shephard & Corey, 1981; Fielding, 1984; Jones, Bly, & Richardson, 1990; Lynch, Golaszewski, Clearie, Snow, & Vickery, 1990; Wood et al., 1989). For example, an investigation of the Du Pont comprehensive health promotion

program revealed an average decline of 6.8 percent in blue collar absenteeism over four years at one site and 7.9 percent over 6 years at another program site (Bertera, 1990a). Conrad et al. (1990) reported the results of studies conducted at the Michigan, Indiana, and Northern Ohio Blue Cross & Blue Shield plans. In Michigan and Indiana the participating groups exhibited significantly less absenteeism than the non-participating groups. Absenteeism, as well as the average duration of each absence, showed a significantly progressive decline over time for only the participating groups. In Michigan, participant absenteeism declined by approximately 30 percent over a three year period. Although the Ohio results did not reveal an effect upon absenteeism, there was a significant decrease in absenteeism for those subjects who increased their exercise levels and lost at least 8 lbs, regardless of program participation. "These results showed that positive behavior change, whether or not the consequence of formalized worksite programs, was associated with reduced illness absenteeism" (p. 576).

An analysis of three years of absenteeism data from 1979 to 1981 at Johnson & Johnson revealed that wage employees participating in the comprehensive health promotion program ("Live for Life" [LFL]) had significantly lower mean sick hours than non-LFL subjects (Jones et al., 1990). Mean sick hours for non-LFL wage employees increased, while mean sick hours for LFL wage employees decreased. In 1981, there was a 20-hour difference between these two groups, with an estimated savings of $200 per year per wage employee. There were no differences among salaried employees. The average hours of absence for salaried employees were considerably lower than the average average hours of absence for the wave employees. Therefore, no changes from this level were anticipated.

In a worksite fitness program monitored over a two-year period, it was found that absenteeism among participants decreased significantly, whereas absenteeism among nonparticipants did not (Lynch et al., 1990). After controlling for age,

gender, and previous absences, program participants experienced 1.2 fewer days absence due to illness than nonparticipants in 1988. There was a significant negative correlation between the rate of participation and the number of absences in 1988. Overall, program participants were less likely to be absent from work due to illness than nonparticipants and were found to have had fewer average days absence in 1988 than when the program began in 1986.

The absenteeism rates of participants and nonparticipants in the General Mills, Inc. comprehensive health promotion program, TriHealthalon, were compared by Wood et al. (1989). Before the program began, the mean days absent of the participant and nonparticipant groups were not significantly different. However, there were significant differences in absenteeism between the two groups during the two following years. The average yearly costs for absenteeism at the end of the program was $503.79 for nonparticipants and $300.87 for participants. This was translated into a $3.10 to $3.90 payback for each dollar spent in developing the TriHealthalon program. In addition, over the two years of the program, the mean days absent for the participating group did not significantly change, whereas the mean days absent for the nonparticipating group significantly increased.

An early study of the relationship between absence from work and physical fitness was undertaken by Linden (1969). Pilot studies included 51 customs officers, 56 firemen, 62 male and female office workers, and 21 male employees from different nonsedentary occupations as subjects. An inverse relationship was found between maximal oxygen uptake and the number of absences only among the 51 customs officers. As maximal oxygen uptake increased, absences decreased. However, no such relationships were found for the other occupational groups.

A study by Haynes, Sackett, Taylor, Gibson, and Johnson (1978) gathered data on absenteeism before and after screening steelworkers for hypertension. The purpose was to determine if labeling employees as hypertensive would result in a rise

in absenteeism. After screening and referral, an increase of 5.2 days per year in absenteeism was reported. This reflected an 80 percent increase, which was far in excess of the nine percent rise in the general employee population. This increase was unaffected by the use of antihypertensive therapy or the degree of blood pressure control achieved. It was posited that this dramatic increase in absenteeism was a result of the hypertensive labeling, with a resultant increase in sick-role behavior.

Several studies have examined the impact of employee health promotion programs on health insurance claims and disability costs and reported that program participation could result in reduced costs (Baun et al., 1986; Bertera, 1990b; Bly et al., 1986; Bowne, et al, 1984; Cady et al., 1985; Gibbs et al., 1985; Shephard et al., 1982, 1983). Shephard et al. examined data on hospital admissions and medical claims for the year previous to as well as the actual year of instituting an employee fitness program at a test company. Employees in the test company tended to have fewer hospital days and fewer medical claims, compared to control company employees. Health-care savings averaged $84.50 per employee per year. Benefits were observed among both participants and nonparticipants at the test company. However, these studies failed to support a possible relationship between health care savings and either gains of fitness or favorable changes of lifestyle among participants.

From 1979 to 1983, a five-year longitudinal study was used to explore the impact of Johnson & Johnson's comprehensive LFL worksite health promotion program on employee health care costs and utilization (Bly et al., 1986). The results indicated that the non-LFL group had significantly higher mean annual inpatient cost increases (i.e., $76) than the two LFL groups (i.e., $43 and $42). The test groups also had lower rates of increase in hospital days and admissions. Breslow et al. (1990) estimated that if health benefit costs were considered in isolation, the annual return on investment was on the order of 30 percent .

Prudential Insurance Company initiated a comparison of major medical and

disability costs among a group of employees before and after participation in a fitness program. A 45.7 percent reduction in major medical costs and a reduction of 20.1 percent in the average number of disability days were reported a year after program entry (Bowne et al., 1984). When compared to the home office population, participants at the test site had 54.1 percent fewer days of disability absences, resulting in a 31.7 percent reduction in disability costs. The reduction in direct disability and major medical costs combined averaged $353.38 per participant, while the operational costs averaged $120.60. Improved levels of cardiovascular fitness were also noted among the participating employees. An inverse relationship was established between the levels of fitness and major medical and disability costs: the higher the level of fitness, the lower the costs. These results suggested that worksite fitness programs may be effective in reducing disability absences and major medical and disability costs.

The purpose of the investigation reported by Baun et al. (1986) at Tenneco Inc. was to determine the effect of a health and fitness program on absenteeism and health care costs after the first year of operation. Lower health care reimbursements were reported among exercisers than nonexercisers of comparable age and sex. Though not significant, a 48.2 percent difference (i.e., $553) in total health care costs was found between exercisers and nonexercisers. Significantly higher nonhospital costs for the exercisers were inexplicable, though it was suggested that exercisers utilized the health care system for minor illnesses. Absenteeism rates prior to and following the initiation of the program did not significantly change. However, there was a lower absenteeism rate among exercisers, with an approximate one-day difference in addition to a significant three-day difference between female exercisers and nonexercisers.

A five-year study conducted by Gibbs et al. (1985) presented data on the health care costs of program participants in the Blue Cross and Blue Shield of In-

diana employee health promotion program. Participants and nonparticipants were compared for the number of claims and payments for ambulatory and in-hospital procedures. Data were analyzed in terms of short-term and long-term (respectively, six months and five years) utilization. Initially, there was not a significant difference in total payments for the two groups for short-term utilization. However, the long-term utilization analysis revealed a significant difference between participant and nonparticipant health insurance claims. Payments per participant were 76 percent of those for nonparticipants, with a reduction of $519.09 in health care costs per participant.

Bertera (1990b) studied the effects of a comprehensive health promotion program for blue-collar workers at a large manufacturing company. Employees at program sites experienced a drop of 14 percent in disability days, while the disability days of employees at nonprogram sites had dropped by 5.8 percent at the end of the second year of the program. Savings at intervention sites from this reduction in disability days resulted in a return of $1.42 for every dollar invested in the program over the two years of the study. Finally, the City of Los Angeles examined the impact of its fitness program upon 1,652 firefighters (Cady et al., 1985). An analysis conducted over an eight-year period following program initiation found that the number of disabling injuries decreased, reducing workers' compensation costs by 25 percent per $100 of payroll.

Program Impacts Upon Health Risk Behaviors

Upon review, Katz and Showstack (1990) have stated that "there is a considerable body of evidence that worksite health promotion programs can yield positive changes in employee health behavior and health status" (p. 838). Anderson and Anderson (1991) found that providing health education through a worksite health promotion program had a significant positive effect on exercise habits, stress aware-

ness, and systolic blood pressure. Fielding (1984) determined that programs aimed at controlling hypertension, high serum cholesterol, and smoking behavior could result in long-term reductions in the incidence of heart disease and stroke. Worksite-based hypertension detection and control programs reflected results that were superior to what had been achieved in clinical practice.

As a strategy to contain medical costs, Montana State University developed a health promotion program for employees and their families (Evans et al., 1989). The goal was to improve overall health status and thereby control participant health care costs. Analysis found both a decrease in smoking behavior and an average weight loss of 6.48 lbs. Among participants in a smoking cessation workshop, 65 percent successfully quit smoking and 23 percent of this proportion remained smoke-free at six months following conduct of the workshop.

A comprehensive pilot health promotion program, the Total Life Concept (TLC), was designed and implemented at AT&T in an effort to promote healthy behaviors among employees. At the end of year one, significant improvements were reported among the study group for exercise levels, the ability to stop smoking, and self-perceptions of personal health (Spilman et al., 1986). The study group also experienced a significant reduction in the risk of heart attack and in the overall risk of dying over the following 10 years. For a colorectal screening program, Campbell Soup had estimated savings of $245,000 from 1969 to 1979. In addition, with 90 percent of its hypertensive employees under treatment, it was estimated that 75 percent of expected strokes per year for the 55-65 age group had been prevented (Fielding, 1984).

As reported by Blair, Collingwood, Reynolds, Prentice, and Sterling (1986), school employees participating in a health promotion program displayed significant improvements in health behaviors, including smoking cessation, exercise initiation, and weight loss. Each effect was associated with improved fitness levels and parti-

cipants also experienced significantly lower absenteeism rates, averaging 1.25 days fewer than nonparticipants. Kronenfeld et al. (1987) evaluated Carolina Healthstyle, a health promotion project for South Carolina state employees. For the intervention agencies, the number of smokers and alcohol consumption decreased significantly, while there was no change for the comparison agencies. However, for safety practices and increases in exercise, change occurred at similar rates for both the intervention and comparison groups.

Employee health risk levels declined significantly after implementation of the Control Data comprehensive health promotion program, Stay Well (Naditch, 1984). The strongest program effects were in the area of smoking cessation. Fifty-eight percent of the respondents reported some change in habits and 35 percent reported substantial improvement. This was compared to an eight percent rate of substantial improvement at control sites. Positive lifestyle changes following one year of participation in the TriHealthalon program at General Mills, Inc. included a decrease in the number of participants that smoked from 21 to 16 percent (Wood et al., 1989). The number of employees that exercised three times each week increased from 48 to 71 percent, and the number of women who performed monthly breast exams increased from 26 to 40 percent of employees. Finally, in a study of the effects of a wellness program at a public school district upon health risk behaviors, participants demonstrated significant improvements in exercise levels, alcohol use, and dietary habits (Yang et al., 1988). Individuals at higher risk exhibited even greater improvements and a significant relationship was found between participation and benefits. Higher health education attendance was positively associated with greater improvement in dietary habits.

Program Impacts Upon Health Indicators

Indicators of health status include, but are not limited to, fitness, weight, per-

ception of health status, feelings of wellbeing, job satisfaction, and job stress. A considerable amount of literature supports the contention that employees who exercise and are in better physical condition are less likely to be absent from work, as well as experience less job stress and greater job satisfaction (Hoffman, 1984). According to Gebhardt and Crump (1990), improvements in employee health is best achieved when the health promotion program is structured and is accompanied by counseling. Programs that provide exercise classes as well as consultations on wellness issues such as weight loss, smoking, and stress management, produce greater improvements in fitness, body fat percentages, feelings of wellness, and reductions in coronary risk factors.

In their study, Cox et al. (1981) found that substantial gains in fitness as well as a significant reduction in turnover were achieved by fitness program participants six months following program implementation, with a 22 percent reduction in absenteeism recorded for high-frequency program adherents. In an investigation of the Johnson & Johnson's LFL program, Blair, Piserchia, Wilbur, and Crowder (1986) found that fitness levels, measured by maximal oxygen uptake, increased significantly for health promotion employees compared to employees that were administered only a health screening. Fielding (1984) also reported on the effects of the Johnson & Johnson program. Comparing the treatment group (n=737) to the control group (n=680), the following significant changes were determined:

1) The treatment group's self-reported sick days decreased 9 percent, while the control group increased by 14 percent;
2 The percent above ideal weight decreased by one percent for the treatment group, where the increase was six percent for the control group;
3) The percent of smokers decreased 15 percent for the treatment group, while the control group decreased by 4 percent;
4) General well-being increased by five percent for the treatment group

versus two percent for the control group; and

5) Satisfaction with working conditions increased by three percent for the treatment group, but decreased by seven percent for the control group.

An early study by Durbeck et al. (1972) found a strong relationship between participation in an exercise program and work performance and attitudes. Participants reportedly worked harder and enjoyed their jobs more and also reported increased positive feelings about their health status, their jobs, their energy levels, the control of weight levels, and decreased stress. Participants also experienced improved cardiovascular function, weight loss, and reduction in skinfold thickness. Job satisfaction is a good indicator of the rates of absenteeism as well as the speed of recovery following accidents. It is increasingly common that workers want organizational involvement in decision-making processes and in the design of their own work tasks. Job satisfaction may be a useful measure of the extent of this involvement. For some occupations, increased productivity has been found to correlate with job satisfaction. It has thus been posited that meeting these needs expressed by workers can increase productivity by as much as five percent (Opdyke & Thayer, 1987).

Participant companies in the Johnson & Johnson health promotion program experienced a significantly greater proportion of overall positive changes in employee attitudes than did nonparticipant companies (Holzback et al., 1990). Significantly positive changes were found in attitudes toward organizational commitment, supervision, working conditions, job competence, pay and fringe benefits, and job security. It was noted that at one LFL company, significant changes in employee attitudes were not recorded. However, it was suggested that local business conditions and the degree of management support may have exercised an equally important effect upon the success of change actions.

In the study of the AT&T comprehensive health promotion program, Spilman et al. (1986) found an improvement in health-related and job-related attitudes among

the study group. Participants felt more positive toward AT&T, their co-workers and supervisors, and felt more productive and energetic. Yang et al. (1988) reported that the health status indicators, including blood pressure, resting pulse, and serum cholesterol, among participants in a wellness program at a public school district improved significantly. At the same time, employee satisfaction increased; from 40 to 90 percent of participants expressed positive gains from the program. Higher exercise attendance was positively associated with higher levels of employee satisfaction.

The impact of a school-based worksite health promotion program, the Health Enhancement Program (HEP), was evaluated by Allegrante and Michela (1990). No differences were detected in job satisfaction between intervention and comparison schools. However, teachers at HEP schools rated their schools as "excellent" significantly more often than teachers at non-HEP schools, and rarely rated their schools as "poor." Analysis also revealed significant improvement in the teachers' sense of empowerment after implementation of HEP programs. It was concluded that the HEP had a significant impact upon teacher morale and that teachers rated school quality and climate more favorably following implementation of the programs. An analysis of participation in an exercise program by Heinzelmann and Bagley (1970) revealed that participation had a positive effect on self-image, attitudes, and beliefs. Participants reported more positive feelings about their health, weight reductions, and their greater ability to cope with stress.

In their study of an employee fitness program, Rhodes and Dunwoody (1980) found that following six months of regular exercise, program participants experienced significant improvements in flexibility and cardiovascular fitness. At the same time, work performance, attitudes, and perceived health status also improved. Similar results were reported by Bernacki and Baun (1984). who found a strong association between above average job performance and increased levels of exercise adherence. In the Montana State University program, it was found that nonpartici-

pants who exercised on their own had the highest overall job satisfaction (Evans et al., 1989). Moreover, Gebhardt and Crump (1990) have suggested that the presence of an employee health promotion program may have a positive impact on the attitudes of all employees, and not just upon participants.

Efficacy of Evaluative Measures

A relatively limited amount of empirical evidence or hard data exists to support the position that health promotion programs can lead to decreased health care costs. According to Katz and Showstack (1990), most companies with health promotion programs do not conduct this form of evaluation, and of those that do, few have used carefully designed and valid evaluative methods. Most of the evaluations that have been conducted have been based upon nonexperimental designs.

Several reasons for this lack of empirical evidence have been identified in the literature (Katz & Showstack, 1990; Terborg, 1986). First, in the interest of quick results, companies often take a "short-term view" of evaluation. Long-term analysis is necessary to measure lifestyle changes and impacts upon health and health care costs. Second, the evaluations that have been conducted may reflect a tendency toward bias evaluation in the effort to positively justify program expenditures. Third, many companies do not maintain accurate records for job performance, absenteeism, employee turnover, or health costs, among other considerations. Fourth, methodological problems have been apparent in this type of research, particularly for evaluations conducted prior to 1986, including: 1) possible self-selection bias due to lack of randomization, 2) inquiries confined to the participant population, or the absence of comparable control group consideration, 3) noncomparability across treatment sites, 4) diffusion of treatment effects, 5) inadequate sample sizes, 6) lack of comparative baseline measures, 9) consideration of participants who are not representative of the worksite population, and 9) the lack of consistent and specific defini-

tions of interventions, risk factors, and outcome measures.

Murphy, Gasparotto, and Opatz (1987) added another perspective to the question of evaluative efficacy, pointing out that "the organizational and political context of evaluation must be considered inseparable from decisions regarding the scientific merit of any evaluation strategy" (p. 36). In other words, organizational needs and expectations must be considered in the selection of evaluation designs and methods. It was also indicated that the issue of valid and reliable experimental evaluative measures "may be overshadowed by organizational constraints on the process and outcome of evaluation" (p. 36). In contrast to the scientific research setting, it is often impossible to conduct a truly experimental evaluation within the client-oriented setting of worksite health promotion programs.

Factors Influencing Participation in Health Promotion Programs

Worksite health promotion programs are successful only to the extent that they are able to recruit participants. Typically, health promotion programs struggle with recruitment and seek ways to reach nonparticipants in an effort to improve participation. Fielding (1982) found that participation rates varied from 20 to 40 percent for onsite programs, but dropped to 10 to 25 percent for offsite programs. These low rates of participation, accompanied by high drop-out rates, have resulted in poor long-term participation levels.

From another perspective, Lovato and Green (1990) stated that "by commercial and public service standards, the conversion of 20% of a population to a new practice in any program would be considered vastly successful" (p. 76), observing that ongoing employee participation is the key to the long-term success of worksite health promotion programs. Participation is also important to the maintenance of behavioral changes, which in turn are necessary for the realization of short-term as

well as long-term health benefits. However, it was at the same time pointed out that some employees are able to maintain health practices without attending a worksite program, while others cannot maintain health practices even with regular attendance. Dropping out of a program may not necessarily mean that the program has failed or that the individual is not maintaining health behaviors. Some participants drop out of a program as they become more independent and require less instruction or support. Rather, they may continue on their own or join an outside program. Participation, then, isn't necessarily a requisite to long-term success in the achievement of health benefits, but for many participants it is important in that the programs facilitate and reinforce change and provide maintenance support.

From findings that those employees who use the largest percentage of health care dollars are also the least involved with health promotion efforts, corporations are looking more closely at the characteristics of participants and those factors associated with participation (Marcocci, 1990). The literature relating to participation in employee health promotion programs is considered in the following section . Specifically, participant characteristics, physical and psychosocial factors influencing participation, and health behavior models are reviewed.

Program Participant Characteristics

A number of studies have indicated that in order to maintain and enhance existing levels of health, worksite health promotions are generally aimed at individuals who are already healthy (Alexy, 1990, 1991; Baun et al., 1986; Conrad, 1987, 1988a; Fielding, 1982; Katz & Showstack, 1990; Lynch et al., 1990; Shephard, Morgan, Finucane, & Schimmelfing, 1980). At the onset, those who elect to participate tend to be healthier than nonparticipants, and reflect greater interest in personal health. According to Katz and Showstack (1990), "programs may . . . be enhancing the relatively healthy and missing those individuals who could benefit from them

most" (p. 841). In turn, individuals who are dissatisfied with their health may not participate because they believe that nothing they can do will help (Davis, Jackson, Kronenfeld, & Blair, 1984). Studies have suggested that participation may have little to do with health status dissatisfaction, and only reflect a concern to maintain an already established positive health status.

Participants who enter and remain in health promotion programs tend to have already established exercise habits and reflect low-risk factors (Fielding, 1982). In an investigation of a health promotion program for blue collar workers, Alexy (1991) found that nonparticipants included a significantly greater number of smokers and individuals with elevated blood pressure than participants. The participants also tended to be younger and more highly educated. In an earlier study, Alexy (1990) also found that a higher percentage of nonparticipants were smokers than were participants. The perceptions of health status for participants were significantly higher than for nonparticipants. Shephard et al. (1980) also found that participants in the General Foods Corporation fitness program tended to observe above-average levels of regular exercise and were more fit than a general population. Results indicated that the majority of participants had positive health attitudes and beliefs, were nonsmokers, and consumed little or no alcohol.

Those entering exercise programs may also use fewer health care services, and may tend to reflect lower rates of employee turnover or absenteeism (Fielding, 1984). Lynch et al. (1990) found that employees who became members of a worksite fitness program were absent significantly fewer days than nonmembers prior to program initiation. Conrad (1988a) described program participants as nonsmokers, more interested in their health, and somewhat healthier than nonparticipants. However, no demographic or occupational differences and relatively few statistically significant lifestyle and health differences were found between participants and nonparticipants. In an examination of the characterizations of participants ($n=100$)

and nonparticipants (n=84) in a wellness program at a Massachusetts medical technology company Conrad (1987), found there were four principal significant characteristics:

1) participants were less likely to be smokers;
2) participants were less likely to be hospitalized in the previous five years;
3) participants were more likely to rate their health better; and
4) participants were more likely to agree that they were more interested in health than most people.

However, there were no significant differences between participants and nonparticipants for age, sex, marital status, family income, job category, hours worked, self-reported absenteeism, chronic health problems or disabilities, health attitudes, total drinks per week, overall stress, or job satisfaction. The findings again suggest that participants tend to be nonsmokers, are more interested in their health, and may be somewhat healthier than nonparticipants.

Health Risk Appraisal (HRA) responders (n=2,600) were compared to HRA nonresponders (n=4,389) for a study of employees at the Travelers Companies home office (Lynch, Golaszewski, Clearie, & Vickery, 1989). Compared to nonresponders, the responders were younger, more likely to file medical claims, and a greater proportion were salaried rather than hourly employees. There were no differences in medical claims amounts when adjusted for age and sex. The researchers suggested that the greater number of medical claims could have resulted from responders' concerns for health issues and their inclination to more readily seek health services.

Settergren, Wilbur, Hartwell, and Rasweiler (1983) examined nonrespondents and respondents to a health screening program in the Johnson & Johnson LFL program. Respondents and nonrespondents were similar demographically, except that males reflected higher levels of education. The following significant differences

were found:

1) more nonresponders were smokers or ex-smokers;
2) more nonresponders reported engaging in regular exercise;
3) Female nonresponders tended to weigh less that responders; and
4) Male nonresponders expressed greater positive health attitudes than responders.

For the greater part, it was concluded that the nonresponse sample did not appear to differ dramatically from those employees who chose to participate in the baseline health screen.

An investigation of the Tenneco Health and Fitness program noted lower absenteeism rates for an exercise group (Baun et al., 1986). However, the absenteeism rates before and after the opening of a fitness center remained approximately the same for both the exercise and the nonexercise group. It was suggested that the difference in absenteeism was related to the characteristics of the exercisers to a greater degree than to the program. Due to the finding that 60 percent of the fitness program participants reportedly were regular exercisers before joining the program, it was concluded that these type of employee health promotion programs seem to attract a self-selected population. It was also indicated that the establishment of these types of programs may provide the immediate benefit of attracting and retaining employees who are more likely to reflect positive work and health behaviors.

The characteristics of health promotion "intenders" have also been subject to investigation (Davis et al., 1984, 1987; Zavela, Davis, Cottrell, & Smith, 1988). Davis et al. (1984) examined the extent to which the Carolina Healthstyle program attracted persons who were more at risk, providing an assessment of the degree of individual satisfaction with current health status and the intent to change this status. It was found that individuals at risk in the areas of weight control, exercise, and the handling of stress and tension, exhibited both greater dissatisfaction with their status

in those areas and a greater willingness to participate in a program of change. It was suggested that these types of programs tend to attract people with moderately high at risk scores who were already committed to improvement in these areas.

Zavela et al. (1988) examined health behaviors and the health status of employees who intended to participate and those who did not intend to participate in a worksite health promotion program. Both the intenders and the nonintenders reported similar and positive lifestyle behaviors as well as preventive health practices. On the other hand, a significantly higher percentage of intenders were nonsmokers, were dissatisfied with their lives and/or jobs, rated their health as either fair or poor, and had experienced personal loss. For intenders, the employee absenteeism rate was also significantly higher. However, a one-year follow-up to the Carolina Healthstyle Study assessed the degree of satisfaction with current health status, intent to change, and participation in a program of change (Davis et al., 1987). Neither the degree of satisfaction with health status nor the intent to change were consistently associated with subsequent participation in a health promotion program. Therefore, the results of these "intender" studies could not be generalized for program participants. In addition, it was found that high levels of job stress and anxiety were positively associated with participation in exercise and weight loss programs.

Factors Influencing Program Participation

Marcocci (1990) described the Pender health promotion model, based upon three categories of factors which influence health promoting behaviors:

1) Cognitive-perceptual factors include the importance of health to the individual, perceived control of health outcomes, self-efficacy, definitions of health, perceived health status, and perceived benefits and barriers to health promotion;

2) Modifying factors include demographic characteristics, biological characteristics, interpersonal influences and social support, situational factors, and behavioral factors; and

3) Cues to action include internal cues directed at awareness of benefits and external cues from other experiences.

A considerable portion of the related literature has been focused upon these listed modifying factors. For example, Terborg (1986) identified employee cost, employee motivation, employee convenience, and attention to employee interests as factors which influence participation. Dishman (1982) found the attitudes of participants' spouses toward the program to be more influential toward adherence than the attitudes of the participants. The attitudes of the employee families, friends, and coworkers was also found by Heinzelmann and Bagley (1970) to frequently determine participation and long-term adherence. Dishman also noted that convenience or the accessibility of the program setting was a major influence on adherence. Lovato and Green (1990) also identified accessibility and convenience as critical to employee participation. A desire to improve health and enjoyment were other factors also found to be reasons for compliance in a fitness program (Rhodes & Dunwoody, 1980).

Howard & Mikalachki (1979) found that the following factors influence participation in exercise programs:

1) individual fitness knowledge,
2) individual fitness level,
3) personal history/background,
4) type of facilities and programs,
5) company time versus personal time,
6) convenience of facilities,
7) voluntary/involuntary nature of program,

8) job factors (workloads),

9) company encouragement, and

10) media persuasion.

In turn, Fielding (1982) proposed a list of factors affecting participation rates in exercise programs which included socioeconomic status, age, health practices, gender, proximity to work stations, flexibility of job schedule, variety of activities offered, hours and days of program operation, support from and participation of management, availability of program supervision, seasonal factors, criteria for entry, and the degree and type of recruitment effort. He also found there was a higher rate of participation in programs offered onsite than in offsite programs. Durbeck et al. (1972) also cited such job-related factors as workload and lack of time as the most frequent reason for nonparticipation. In 1984, Fielding expanded this list of factors affecting participation rates by adding costs to employees, whether the program was open to family, the personality of supervisors, the way in which achievements were quantified, workload, and travel requirements of the job.

The participation rate of blue-collar workers (i.e., from three to five percent) is known to be much lower than for white-collar workers (Gebhardt & Crump, 1990). Alexy (1990) examined factors associated with participation among a blue-collar population, concluding that nonparticipants perceived fewer benefits from health promotion activities and faced more barriers to these activities than did participant groups. The barriers reported by both groups included working over-time, shift work, having a second job, car-pooling, long distance from work to home, home responsibilities, being too old, too unfit, and lacking energy. Alexy (1991) subsequently compared the characteristics and factors that distinguished work-site health promotion program participants and nonparticipants within the same blue collar populations. Self-efficacy was the strongest factor that distinguished partici-pants from nonparticipants. Nonparticipants tended to view themselves as being too

old, too unfit or lacking in energy resources, and responded that they would have difficulty sticking with the programs. They were more likely to identify shift work, overtime, and outside responsibilities as barriers to participation. Social support was also associated with participation.

Sloan & Gruman (1988) viewed participation in worksite health promotion programming as an organizational activity as well as a health promotion activity, stating that "organizational factors such as managerial style, performance goals, and company-wide norms may influence behavior in the workplace independent of the more widely studied determinants of health behaviors" (p. 272). Organizational factors may influence participation indirectly through the increase of stress-produced negative health conditions which motivate participation, or directly in the sense of influencing organizational behavior in the direction of participation. In a study of the predictors of recruitment and on-going health program participation, Rost, Connell, Schechtman, Barzilai, and Fisher (1990) stated that "the predictors of recruitment are almost mirror images of the predictors of participation" (p. 403). Males, management personnel, and highly educated individuals were more likely to be recruited, although only the management category was found to be statistically significant. On-going participants were more likely to be female, nonmanagement, and less educated. Extended participation among higher risk employees was significantly lower. Spilman et al. (1986) also found that gender was a critical factor that influenced participation patterns, stating that "women participate in more programs, and they participate more actively than men in health treatment programs" (p. 533).

Lovato and Green (1990) outlined four sets of correlates that tend to predict participation:

1) demographic and socioeconomic characteristics such as age, sex, and education;

2) motivational characteristics;

3) physical, manual or economic facilitators or barriers; and

4) rewards and penalties associated with the behavior.

It was also emphasized that the maintenance of participation requires both an individual and an environmental approach. "One of the most important considerations in maintaining program momentum is organizational climate" (p. 80). Nonsmoking policies, flex-time, nutritious food offerings, publicizing activities, health fairs, and lunch time seminars were examples of the organizational variables that supported positive health practices. A supportive environment and positive attitudes among upper management encouraged long-term participation and, therefore, long-term benefits.

In a study of compliance and adherence to an exercise program, Dishman (1982) ascertained that attitudes and health beliefs may be important determinants of initial involvement, but do not effectively predict adherence. However, individuals who had both positive feelings toward exercise and felt responsible for the consequences of their behaviors tended to exercise longer and more frequently than those with an opposite view on both scales. Although health beliefs appeared to motivate initial involvement, enjoyment and a sense of well-being seemed to be stronger motives for adherence to corporate programs (Dishman, Sallis, & Orenstein, 1985). Those who perceived little value or benefit from exercise and who also believed health outcomes were out of their control, exercised less frequently and dropped out of fitness programs sooner. Blue-collar workers, smokers, and obese persons were more likely to drop out of these programs.

Health Behavior Models

Health beliefs appear to be key factors influencing participation in health promotion programs. Scofield (1990) stressed the importance of basing worksite health promotion programs on a model or theory of health behavior, thus providing a con-

sistent framework for the determination of evaluation techniques and the means to improve compliance. Three models of health behavior are reviewed in this section, including: 1) the Health Belief Model, 2) Health Locus of Control, and 3) Self-Efficacy.

Health Belief Model

In 1952, Hochbaum originated the research on the Health Belief Model in the attempt to identify factors associated with the decision to obtain a chest x-ray for the detection of tuberculosis (Rosenstock, 1974). Perceived susceptibility to tuberculosis and the perceived benefits of undergoing an x-ray were tested, indicating that the perception of susceptibility was the more powerful predictor. Rosenstock reviewed numerous studies that applied the four components of the Health Belief Model as a means of explaining and/or predicting health behaviors, including: 1) perception of susceptibility to disease, 2) potential severity of the disease, 3) potential benefits of the health behavior to reduce susceptibility or severity, and 4) perceptions of barriers to the health behavior. It was found that research findings had supported the importance of the variables in the Health Belief Model, particularly perceived susceptibility and perceived benefits as explanatory or predictive variables. There were uncertainties regarding the importance of perceived severity as an explanation of health behaviors. Rosenstock concluded that individual decisions to adopt a particular health practice were influenced by the motivation, perceived susceptibility to illness, the perceived severity of the illness, beliefs about the efficacy or benefits of behaviors, psychological barriers, interpersonal influences, and one or more cues which triggered a response. Therefore, it was determined that efforts to increase participation in health promotion programs should aim at minimizing barriers, increasing opportunities to act, and providing cues to trigger responses.

Janz and Becker (1984) presented the results of a comprehensive review of

Health Belief Model-related research published in the 10 years following the Rosenstock (1974) review, as well as an overall summary of all published research. "Overall these investigations provide very substantial empirical evidence supporting Health Belief Model dimensions as important contributors to the explanation and prediction of individuals' health-related behaviors" (p. 41). A significance ratio was determined for each of the four model dimensions by dividing the number of positive and significant findings by the total number of studies reporting significance levels for that dimension. In the majority of the studies, each dimension was found to be statistically associated with the health-related behaviors examined. The order of the four dimensions, from the strongest significance ratio to the least, was 1) perceived barriers (89%), 2) perceived susceptibility (81%), 3) perceived benefits (78%), and 4) perceived severity (65%). Though perceived barriers was the most powerful overall predictor of health-related behavior, susceptibility was found to be more important in preventive health behaviors than for sick-role behaviors. However, the reverse was observed for benefits. Alexy (1991) stated that "perceived benefits of and barriers to health promotion activities influence whether or not an individual participates in health promotion behaviors" (p. 37).

A study by Weissfeld, Kirscht, and Brock (1990) measured the components of the Health Belief Model as well as the sense of general health concern and general health threat among a general population. A statistically significant negative association was found between educational level and susceptibility to specific chronic illnesses. Individuals with higher educational levels were more likely to feel less susceptible to these illnesses than individuals at lower educational levels. Female, Black, older, and lower socioeconomic status subjects had favorable health beliefs, and appeared to place value on health promoting personal practices.

An investigation of clients who came to a Coronary Detection and Intervention Center for a heart disease risk assessment was undertaken by Mirotznik, Speed-

ling, Stein, and Bronz (1985). Those clients who went on to join the fitness program were in poorer physical condition than nonjoiners. A significantly higher proportion of joiners reported having a heart condition, high blood pressure, and were worried about their health. They believed that improved health status would benefit other aspects of their lives.

In examining participants and nonparticipants in an AT&T wellness orientation session, Sloan & Gruman (1988) found three sets of factors which influenced participation:

1) Perceived risk or vulnerability led to dissatisfaction with health, leading to increased intention to change culminating in increased participation;
2) The sex of employees significantly differed, with women significantly more likely to participate than men; and
3) The organizational factor of perceived supportiveness of supervisors was significantly greater for participants than nonparticipants.

The magnitude of the relationship between perceived supportiveness of supervisors to participation was as great or greater than the other two determinants of sex and intention to change health habits.

The predictor variables for participation, attrition, and the outcome of a worksite smoking-cessation program were evaluated by Klesges et al. (1988). Results indicated that health beliefs and attitudes were significant predictors of participation, attrition, cessation, and continued abstinence. The belief of personal vulnerability to disease was a significant predictor of participation, and the belief in a lack of post-cessation weight gain was a significant predictor of cessation and continued abstinence.

Langlie (1977) suggested modification to variables to improve the predictive power of the Health Belief Model. Perceived internal locus of control was proposed

as the most successfully used modifying variable. People who viewed themselves as exercising some control over what happened to them, were more likely to perceive preventive health behavior as efficacious. Saliency of health was another important modifying variable proposed. Individuals for whom health was salient or was given a high priority, were more likely to be motivated to engage in preventive health behavior. Therefore, it was found that the Health Belief Model, subject to the modified variables, could be used to predict positive relationships between preventive health behavior and high perceived susceptibility, high perceived benefits, low perceived barriers, internality of control, saliency of health, positive attitudes toward providers of care, and appropriate social and psychological characteristics.

As a psychosocial model, the Health Belief Model does not measure or account for other variables influencing behavior, such as the habitual component in drug use, nonhealth reasons for behavior, and economic and/or environmental hindrances (Janz & Becker, 1984). "The model is predicated on the premise that 'health' is a highly valued concern or goal for most individuals, and also that 'cues to action' are widely prevalent" (p. 44). The model is relevant and useful only under these conditions.

Health Locus of Control

According to Strecher, DeVellis, Becker, and Rosenstock (1986), "health locus of control refers to a generalized expectation about whether one's health is controlled by one's own behavior or by forces external to oneself" (p. 77). Rotter (1966) described health locus of control as the area from which an individual's health is controlled. An internal orientation is the belief that health is primarily controlled by the individual's own behavior, whereas an external orientation is the belief that health is controlled by something external to the individual and that there is little that can be done to alter the events that affect health. Personal control has been defined

as an individual's beliefs about how well he/she can bring about good events or avoid bad events, involving beliefs that one can effect outcomes, choose among them, cope with their consequences, and/or understand them (Peterson & Stunkard, 1989). In parallel to Bandura's (1982) outcome and efficacy expectations, Peterson and Stunkard proposed that a "program can succeed if its participants believe that its steps will lead to desired outcomes and that they have the capacity to undertake them" (p. 824). Thus, health promotion programs work to the degree that they engage personal control.

Saltzer (1981) investigated the influence of locus of control expectancies and outcome values on the relationship between behavioral intentions to lose weight and actual weight loss. Results indicated that internals with high outcome values for physical appearance or health were significantly more likely than externals with high outcome values to translate intentions to lose weight into actual weight loss. Saltzer stated that "among individuals who believe that certain behaviors lead to highly valued outcomes, internals are more likely than externals to perform those behaviors" (p. 260). In general, internality is associated with positive health behavior.

Self-Efficacy

Several studies supported self-efficacy as a key predictor of change in health behavior (Beck & Lund, 1981; DiClemente, 1981; Kaplan, Atkins, & Reinsch, 1984; Mullen, Hersey, & Iverson, 1987). Self-efficacy influences the acquisition of new behaviors, behavioral change, the amount of effort expended, and the degree of persistence. According to Strecher et al. (1986), "self-efficacy appears to be a consistent predictor of short- and long-term success" (p. 87). Or, "perceived self-efficacy is concerned with judgements of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p. 122). This judgement of self-efficacy is one determinant of behavior, the maintenance of behavioral

changes, and the degree of adherence. When individuals doubt their capabilities, they often give up in the face of adverse circumstances. On the other hand, those who have a strong sense of self-efficacy will exert greater effort to master challenges. High levels of perceived self-efficacy are associated with greater performance accomplishments and greater persistence.

O'Leary (1985) described self-efficacy as individual perceptions of coping capabilities in specific areas. Self-efficacy determines which activities will be attempted and which will not; it also affects the amount of effort devoted to the task and the degree of persistence. Improved self-efficacy has been shown to be associated with a reduction in smoking and has also been associated with long-term compliance. Individuals who are fully convinced of the beneficial effects of treatment and their capability to carry out the regimen will be more likely to adhere.

The results of an investigation of the prediction of adherence to exercise in a physical fitness program indicated that the expectation of self-efficacy was a stronger determinant of adherence than the expectation of outcome (Desharnais, Bouillon, & Godin, 1986). Those individuals that subsequently dropped out of the program were less certain than were adherers of their capacity to regularly attend the program throughout the 11-week sessions. They also expected more benefits from the program. In an investigation of the predictability of dissatisfaction and intent to change, personal efficacy was the most consistently important predictor (Davis et al., 1984). It was determined to be a significant predictor of both dissatisfaction and intent to change, whereas job stress and anxiety made a consistent contribution only to the prediction of dissatisfaction. Health knowledge had little effect on dissatisfaction or intent to participate.

Woodward and Wallston (1987) found that perceived self-efficacy as related to health and general day-to-day living was found to be lower for persons over 60 years of age. The authors concluded that those individuals who are more at risk in

the health care system are also more likely to perceive themselves as less capable than others and may be more likely to give up in terms of their health care. According to Strecher et al. (1986), behavioral change and maintenance are functions of outcome expectations and efficacy expectations. Outcome expectations were described as beliefs about whether given behaviors will lead to given outcomes and benefits. Efficacy expectations were described as beliefs about how capable one is of performing a specific behavior. Thus, it was proposed that health behaviors which are not difficult to adopt, but have uncertain benefits, may depend more upon outcome expectations. However, health behaviors that are difficult to adopt or change, but are believed to have desirable outcomes, are probably more dependent upon self-efficacy. When the behavioral change is difficult and the consequences are uncertain, then both outcome and efficacy expectations may be required for successful change.

Summary

The trend towards developing worksite health promotion programs continues to gain momentum in corporate America. Over the last 20 years, research has indicated that worksite health promotion programs may be effective in reducing health care costs, employee absenteeism, disability costs, and employee turnover, as well as decreasing employee health risks, improving employee exercise and fitness levels, and improving health and work attitudes. Health promotion programs are also believed to enhance corporate images and improve employee morale and job satisfaction, as well as productivity.

There is considerable evidence that worksite health promotion programs can effect positive changes in health behavior and the health status of participants. However, there is limited empirical data available to support the belief that these pro-

grams will lead to reduced health care costs. This has been a result of methodological problems, including possible self-selection bias, lack of comparable control groups, inadequate sample sizes, and diffusion of treatment effects. In spite of this lack of scientific research, current evidence suggests that worksite health promotion programs can positively impact employees (Pencak, 1991). Gebhardt and Crump (1990) also stated that "recent research using control groups has found relations between reduction in health care costs, absenteeism, and turnover and implementation of comprehensive health promotion programs" (p. 262). Fielding (1982) adds,

> there is little question that those who have participated in industrial fitness programs tend to have lower risk characteristics including lower cigarette consumption and lower age-adjusted blood pressure and cholesterol levels. However, those entering fitness programs share these advantages compared with nonparticipants, which leaves unresolved whether participation causes a reduction in those risk indicators. (p. 910)

In addition, current research indicates that participants in employee health promotion programs are likely to be nonsmokers, more physically active, and more concerned with health matters. These programs seem to appeal to the self-selected, healthier population.

Participation in worksite health promotion programs is seemingly influenced by a complex interplay of individual characteristics, including psychosocial factors and health behaviors or attitudes, as well as sociodemographic factors, including environmental factors and the organizational climate. Attitudes of spouses were also found to be a strong influence upon employee participation. The most frequently cited physical factors were convenience or accessibility and time. However, because time is also viewed as a problem for active participants, it may be more a matter of lack of interest or commitment (Dishman et al., 1985).

Of the three models of health behavior reviewed, the Health Belief Model, Health Locus of Control, and Self-efficacy, the latter was seemingly considered to be the single most important predictor of health behavior change. As with participation

prediction, preventive health behavior is influenced by a combination of psychological factors. Those exercising the greatest influence include perceived barriers to the health behavior, perceived susceptibility to disease, internality of control, and self-efficacy.

The most effective and beneficial worksite health promotion programs are those that are comprehensive in nature, spanning all three program levels of screenings and assessments, health education classes, and environmental or organizational changes supporting behaviors conducive to good health. Scofield and Martin (1990) stated that "changing the organization's culture is the essence of any successful health promotion program . . . . This requires a systematic assessment of organizational variables" (p. 756).

CHAPTER 3

METHODS AND PROCEDURES

The research design and the methodologies employed for the selection of the sample, quantitative and qualitative data collection, instrument design, and data analysis are described in this chapter.

Subjects

A sample population of 319 adults was selected from among a full-time employee population of approximately 580 staff members at Chemeketa Community College in Salem, Oregon. Chemeketa is the second largest community college in Oregon, serving approximately 39,000 students each year. This student population is primarily a commuter population, many of whom work either part-time or full-time. Classes are held on campus and at five centers located throughout the college district. To further meet the needs of working students, Chemeketa offers evening and weekend classes. To provide opportunities to staff located off-campus and to meet the diversity of work schedules presents a challenge to the Health Promotion Committee. The sample was composed of two principal groups of subjects, designated as either "participants" or "nonparticipants" in the Chemeketa employee health promotion program. Assignment to one of the two groups of subjects was determined as follows.

Subjects classified as participants (n=173) were identified and selected by combining institutional records of participants in regularly conducted employee health risk assessments, an employee incentive program, and in regularly conducted

staff aerobic exercise programs during the years 1988 and/or 1989. Moreover, each subject selected as a participant was determined to be a full-time salaried employee for at least one of the two study years. Participation in at least one health risk appraisal, one staff aerobics class, or one year in the incentive program were the minimum requirements for participant status. Participants were then categorized as either "occasional" (n=119) or "regular" (n=54) participants. Regular participants earned an incentive award for at least one of the two study years and participated in staff aerobics during 1988 and 1989; or, if the subject had been employed for only a single year during this period, an incentive award was earned during the year of employment. The remainder of the participants were classified as occasional participants.

Subjects classified as nonparticipants were randomly selected from an alphabetized list of the remainder of the full-time salaried employees (i.e., to the exclusion of those determined to be participants, either regular or occasional). To control for the potential confounding effects of age and gender and to assure that the two sample groups were comparable, each third name on the list was selected by matching it to a participant name in the same gender (male and female) and age ranges. Considering that the sample population consisted of working age adults, the following age ranges were defined:

less than 21 years,

21 to 30 years,

31 to 40 years,

41 to 50 years,

51 to 60 years, and

more than 60 years.

This matching process was continued until an equivalent number of nonparticipants (n=173) and participants (n=173) was obtained. It could thus be determined that

the two subject groups were identical with regard to gender and age ranges. It was assumed that these two characteristics were the only relevant variables that should be subject to control. Moreover, the ability to further extend the matching process was limited by the small number of subjects (i.e., approximately 400) from among whom nonparticipant subjects could be selected.

Subsequent to this selection process, it was determined that 27 of the originally selected 173 nonparticipants were not employed at Chemeketa for the entirety of either or both 1988 and 1989, but had been hired during the course of the conduct of this study. For purposes of data analysis, these 27 subjects were eliminated from further consideration for this study, resulting in a final number of 146 nonparticipants.

In view of the fact that the subjects in the two comparison groups were not randomly assigned, this study should be classified as quasi-experimental in nature. Although it was recognized that differential selection is a threat to the internal validity of an experimental study, the selection process described above was utilized in the effort to control for the confounding effects of "volunteer" characteristics (Borg, 1987, p. 244). Descriptive data for the two comparison groups were collected to further determine the comparability of the two groups. This data is considered in Chapter 4, from which analysis it was determined that the two groups were comparable.

Criteria for Determination of Participant Status

The Chemeketa health risk assessment program, based upon the Lifestyle Inventory and Fitness Evaluation (LIFE) (Hall, 1984), was administered to the staff by Salem Hospital twice yearly in the fall and spring. LIFE is a two-part assessment for the evaluation of both wellness and physical fitness. Following administration of

the assessment, Salem Hospital staff provided personal wellness profiles and follow-up classes to the participants. A corporate report of the summarized data was also provided to the Health Promotion Committee. The wellness evaluation is a comprehensive 16-page questionnaire covering topics such as attitudes toward health, physical activity, consumption of alcohol, smoking status, stress, safety behaviors, and eating habits. The fitness evaluation includes a blood screen for cholesterol, triglycerides, and glucose, body composition assessment, lung function, hydrostatic weight, musculo-skeletal fitness, and cardiovascular fitness. The data derived from administration of the LIFE was not considered in the analysis of the results of the current study. Rather, it was used as a means to identify and classify subjects who partipated in the assessment.

Tangible incentives were offered by the Chemeketa Health Promotion Committee to employees who participated in wellness activities. These incentives were awarded in accordance with the total number of recorded aerobic hours, nonaerobic fitness hours, and positive health habits hours, including attendance at educational workshops. Aerobic activities lasting at least 15 minutes and providing a heart rate between 70 to 85 percent of the maximum heart rate were considered to be aerobic hours. Examples of nonaerobic fitness activities included racquetball, tennis, handball, volleyball, golf, and weight training. Positive health habits included relaxation training, health assessments, wellness lectures/workshops, and health-related classes.

Staff aerobic classes were conducted once in each of the study years. Class lists from spring 1988 and fall 1989 classes were used to identify participants. Other health promotion activities sponsored by the committee include several special events, as well as workshops and seminars covering a variety of health topics. These activities could not be considered as definitive criteria for selection as a study participant because attendance records were not maintained.

Data Collection

Multiple comparisons of participants and nonparticipants were conducted on the basis of data obtained from employer records and from the administration of a survey questionnaire developed for this investigation. Confidentiality and anonymity was assured throughout the study. The methods of data collection are discussed in the following sections.

Employer Records

Quantitative health cost data were obtained in the form of absenteeism hours, health insurance claim monies, and workers' compensation claim monies. Qualitative sociodemographic data, including gender, age, and job classification, were also collected from employer records. Sick leave hours for 1988 and 1989 were presented separately and as part of a two-year average. Health insurance claim data and workers' compensation claim data were provided by the employer's insurance companies. The workers' compensation data were also presented as an average of 1988 and 1989 insurance payments as well as separately by year. As a result of a change in insurance carriers during 1989, health insurance claim data were available only for 1989 . Out-of-pocket expenses, deductibles, copayments, and other personal medical expenses were not included in this figure.

Preparation and Administration of the Survey Instrument

Other qualitative data were gathered from the administration of a questionnaire, the Chemeketa Health Inventory, tailored by the investigator to address specific components of the Chemeketa Employee Health Promotion Program and designed to reflect the purpose of this investigation. Program effects and the factors influencing participation in the health program were assessed, and further demographic infor-

mation, as well as information on subject health risk behaviors, health indicators, and health concerns, was derived from administration of the survey instrument. The Survey Research Center at Oregon State University assisted in the development of the questionnaire.

As originally developed, the instrument was pilot tested among approximately 20 employees at Chemeketa Community College (Appendix A). To provide constructive comments, members of the Health Promotion Committee and other employees selected by committee members were included in the pretesting process. Suggestions for improvement and clarification, including suggested improvements in format and wording, were solicited and incorporated into the final survey form. Following refinement and adjustment of the survey instrument, a total of 319 final questionnaires were then administered to the subjects of this investigation by means of campus mail (Appendix B). However, at the time the survey was distributed (May, 1990), 10 of the 319 subjects were no longer employed at Chemeketa Community College. Of the remaining 309 returnable surveys, 191 responses (i.e., a rate of response of 63 percent) were returned through campus mail after initial nonresponders were contacted by follow-up phone calls.

Information for measurement of the variables listed below was solicited through administration of the survey instrument. Although the extent of the questions was limited due to the need to measure a broad range of variables, they were intended to serve as major indicators or predictors of the variables analyzed. The survey questions designed to measure health risk behaviors and psychological characteristics were supported in the literature as valid and significant measures of these behaviors and characteristics. Lifestyle behaviors such as smoking, alcohol use, physical activity, and dietary habits have been identified as risk indicators and have been shown to be major factors in causes of death from heart disease, cancer, stroke, and accidents (Belloc & Breslow, 1972; Conrad, 1988b; Fielding, 1984; Matarazzo,

1984; Terborg, 1986). Questions assessing the psychological characteristics of health beliefs, health locus of control, and self-efficacy were also validated by the literature (Langlie, 1977; Mullen et al., 1987; O'Leary, 1985; Rosenstock, 1974; Saltzer, 1981).

1) Demographics, including marital status, total family income, and number of children in the household;
2) Risk behaviors, including smoking, alcohol use, physical activity, and eating habits;
3) Health indicators, including absenteeism due to personal illness, self-rated health status, job satisfaction, job stress, and height/weight;
4) Factors associated with participation, including psychological characteristics (health locus of control, health belief model, and self-efficacy), and physical and organizational factors;
5) Program effects, including perceived benefits reported by subjects in areas of specified health behaviors and/or health information; and
6) Health concerns, directed at the respondent's two major personal health concerns or problems.

Analysis of the Data

The data was analyzed to determine significant differences for the statistical hypotheses among subject classifications for the variables presented in the previous section, using the *SPSS/PC+* statistical package for IBM personal computers (SPSS, Inc., 1988). Two-group comparisons were made between participants and nonparticipants, and between questionnaire respondents and nonrespondents. Three-group comparisons were made between occasional participants, regular participants, and nonparticipants. The significance level for analysis was set at $p < .05$ for all tests conducted.

Qualitative categorical data obtained from the questionnaire and from the employers' records were analyzed through application of contingency tables and chi-square statistics to determine if there were significant differences among the compared variables. Qualitative data were also obtained for questionnaire respondents and nonrespondents with respect to selected sociodemographic variables and tested by means chi-square analyses.

The quantitative interval data collected from the questionnaire were analyzed by application of t-tests and a one-way analysis of variance (ANOVA) to determine if significant differences existed between sample means for each subject group. For three-group comparisons, when significant differences were determined by one-way ANOVA, the Student-Newman-Keuls procedure was performed as a multiple-range test for the identification of the groups between which significant differences existed.

The Kolmogorov-Smirnov Goodness-of-Fit test was used to test for the normality of distributions of sick-leave hours data collected from the employer's records, as well as self-reported absence data collected from the completed surveys. These results were used to determine appropriate statistical tests. As a result of the determination that all of the absences, health insurance claims, and workers' compensation claims data were not normally distributed, the nonparametric Mann-Whitney U-test was performed on these nonstandard distributions.

CHAPTER 4

RESULTS

This study was conducted to examine factors influencing participation, and to compare employee health promotion program participants and nonparticipants with respect to differences in health status and health care costs. At the time this research project was initiated (spring 1990), the Chemeketa Community College Employee Health Promotion Program had been in existence for several years and, through self-selection, the employee population was divided into participating and nonparticipating groups. As a consequence of the nonrandom assignment of the subjects to the comparison groups, the research was determined to be quasi-experimental in nature.

This chapter presents results of the analyses of the five research questions posed in Chapter 1:

1. Can physical and psychological factors that may influence participation in an employee health promotion program be identified and described?
2. Can it be determined if an employee health promotion program reportedly impacts selected health behaviors and/or the perceived acquistion of health information and increased awareness of health risks of program participants?
3. What are the most significant personal health concerns or problems identified by participants and nonparticipants in an employee health promotion program?
4. Are there significant differences between participants and nonpartici-

pants in an employee health promotion program with respect to selected sociodemographic, health care cost, reported health risk behavior, and/or health indicator variables?

5. Are there significant differences between respondents and nonrespondents to a personal health inventory tailored to the issue of the effectiveness of an employee worksite health program with respect to sex, age, job classification, or participation category?

A description of the selection criteria of the study groups is presented to provide information on the comparability of the two groups, followed by consideration of the results of the descriptive analysis of research questions 1, 2, and 3. Qualitative data collected from questions from the Health Inventory (Appendix B) were used for the analysis of the results for the first three research questions. Finally, the results of the statistical analyses of the hypotheses developed from research questions four and five are presented. Research questions four and five and hypotheses one through six (Ho_1—Ho_6) were designed to assess differences between the comparison groups. The variables tested included sociodemographic characteristics, health care costs, reported health risk behaviors, and health status indicators. The statistical analysis section concludes with the presentation of selected comparisons of interest, including comparisons of regular participants, occasional participants, and nonparticipants with respect to the same variables tested for the participant and nonparticipant analyses identified above.

Descriptive Analysis

The study groups were composed of full-time salaried employees who had been employed at Chemeketa during the entirety of 1988 and/or 1989. Participants ($n=173$) were selected by combining the records of participants in the health risk

assessment, incentive program, and the staff aerobics program from 1988 and 1989. The nonparticipant selection process began with removal of the 173 participant names from a list of full-time salaried employees. The remaining list of 411 names was then used to select the nonparticipant sample for the study. Selection was effected by matching each third name on this list to a participant of the same gender and age range category. Of the 173 nonparticipants originally selected by this method, 27 were subsequently eliminated because they had not been Chemeketa employees for the entirety of either or both 1988 or 1989. This resulted in the final nonparticipant sample size of 146.

Due to the employment of a matching process to select the two comparison groups, the groups were equivalent with regard to gender and age range categories. Of the 173 participants, 123 were female (71%) and 50 were male (29%). Similarly, 101 (69%) of the 146 nonparticipants were female, while 45 (31%) were male. The most prevalent age range category was the 41 to 50 years group, with 79 (46%) of the participants and 68 (47%) of the nonparticipants placed in that category. The next in frequency was the 31 to 40 years group, with 44 (25%) participants and 32 (22%) nonparticipants placed in this age range category. The 51 to 60 age range category was the third largest group, with 34 (20%) participants and 32 (22%) nonparticipants. Therefore, 157 (91%) participants and 132 (90%) nonparticipants were between the ages of 31 to 50 years.

Selected Psychological Parameters

The psychological characteristics of the sample population that were analyzed included health locus of control, health beliefs, and self-efficacy. The psychological data were collected from administration of the Health Inventory survey. Respondents answered a series of 10 questions by circling a number between one and four,

corresponding to one of four Likert Scale values from strongly disagree to strongly agree, or a fifth "don't know" category. The 10 questions were divided into three psychological variable categories. The first four questions (i.e., a through d) measured health locus of control, the next two questions (i.e., e and f) measured self-efficacy, and the last four questions (i.e., g through i) measured health beliefs, including perceived susceptibility, benefits (i.e., h and i), and severity. Each response was summed according to category, resulting in a numeric score for each category or for components within a category.

Responses were scaled from one to four, where four represented the highest or strongest value for each variable measured. That is, for health behavior change, as well as susceptibility, severity, and benefits, a score of four represented the highest sense of self-efficacy or self-perception of effect. However, for the health locus of control mean score, four represented the strongest internal orientation, while a mean score of one represented the strongest external orientation.

Results of the analysis indicated that the respondents health locus of control mean score (3.0) was in an "internal" direction. In other words, the respondents tended to believe that their health was primarily controlled by their own behavior. The mean self-efficacy score (3.32) was in the direction of a high sense of self-efficacy. Therefore, survey respondents viewed themselves as capable of successfully changing their health behaviors.

Respondents also had high perceptions of the benefits of positive health habits (mean = 3.48), accompanied by high perceptions of the severity of heart disease and cancer (mean = 3.35). Perceived susceptibility to illness was slightly lower than the other two health dimensions, but was still higher than average (mean = 2.70).

Research Question One

Can physical and psychological factors that may influence participation in an employee health promotion program be identified and described?

The physical factors influencing participation were determined by responses to 14 Health Inventory questions. Each respondent was asked to indicate the degree to which he/she agreed or disagreed with statements based on a five-point Likert scale. Some of the questions were worded in the negative, such as "I did not attend because . . . ," in an effort to determine reasons for nonparticipation. Other questions were directed at determining reasons for restricted or limited attendance at activities by either participants or nonparticipants. For example, one question asked for a response to the statement: "I was unable to attend activities offered before or after work because of a lack of child care." Therefore, several variables that either limited or prohibited participation in various health promotion activities were identified.

Three limiting factors were identified by the respondents. The majority of the respondents (52.1%) agreed (i.e., either strongly agreed or agreed) that the meeting times of the activities were inconvenient. The majority (63.7%) also indicated that their job schedules limited their ability to attend. The third factor identified was "activity overload." The majority of respondents (61.2%) indicated that they did not participate because they were already overloaded with activities. It is interesting to note that all three of these variables are related to real or perceived time constraints. Findings are indicated in Table 4.1. Working off campus, costs for activities, lack of child care, lack of awareness, inconvenient locations, lack of family/social support, physical limitations, preference for activities unrelated to job, activities not meeting needs, or lack of desire to participate did not appear to limit or hinder participation in health promotion activities for the majority of respondents.

Table 4.1 Factors Inhibiting Participation.

Factor	SD N (%)	D N (%)	A N (%)	SA N (%)	DK/NA N (%)
Time	19 (09.8)	58 (29.9)	62 (32.0)	39 (20.1)	16 (08.2)
Job Schedule	27 (14.0)	33 (17.1)	73 (37.8)	50 (25.9)	10 (05.2)
Overload	16 (08.3)	47 (24.4)	76 (39.4)	42 (21.8)	12 (06.2)

Scale: SD = strongly disagree; D = disagree; A = agree; SA = strongly agree; DK/NA = don't know/not applicable.

Research Question Two

Can it be determined if an employee health promotion program reportedly impacts selected health behaviors and/or the perceived acquistion of health information and increased awareness of health risks of program participants?

Program effects were measured by asking all of the subjects to respond "yes," "no," or "doesn't apply" to a list of seven possible perceived benefits gained from program participation. The effects of the health promotion program were believed to diffuse throughout the entire employee population due to campus-wide distribution of a commercially produced health promotion newsletter (HOPE), as well as through other campaigns and promotional media. In addition, although an individual may have been classified as a nonparticipant for the purposes of this study, this individual may have attended various health-related seminars. Therefore, these questions were intended to measure program effects for those classified as either participants or nonparticipants.

A strong majority of the respondents reported increased physical activity, weight control, improved eating habits, gained new information, and gained awareness of health risks as ways in which the health promotion program benefited them

or influenced them in positive ways. Table 4.2 indicates the responses to these seven questions.

Table 4.2 Employee Health Promotion Program Benefits.

Benefits	Yes N (%)	No N (%)	Doesn't Apply N (%)
New information	157 (81.3)	24 (12.4)	12 (06.2)
Aware of health risks	150 (77.7)	28 (14.5)	15 (07.8)
Increased physical activity	125 (65.4)	43 (21.7)	23 (12.0)
Improved eating habits	105 (55.3)	61 (32.1)	24 (12.6)
Weight control	84 (44.7)	66 (35.1)	38 (20.2)
Stress management	78 (42.6)	76 (41.5)	29 (15.8)
Stopped smoking	4 (02.2)	26 (13.1)	155 (78.3)

Research Question Three

What are the most significant personal health concerns or problems identified by participants and nonparticipants in an employee health promotion program?

Subjects were asked to identify two health problems that currently concern them by selecting first and second greatest concerns from a list of 15 health problems. The majority of the respondents identified being overweight/overfat (26.9%) as their greatest personal health concern and lack of fitness (16.9%) as their second selection. For both the first and second health concern selections, stress was the third choice. Therefore, being overweight/overfat, lack of fitness, and stress were consistently selected as the greatest personal health concerns of the sample population.

Following the health concern question, subjects were asked if they were doing anything about these health concerns/problems. Nineteen (9.9%) of the respondents

indicated that they were doing nothing, while 173 (90.1%) indicated that they were taking some action towards dealing with this health concern. These actions included changing behaviors by themselves, seeking help outside of the organization, or attending a health promotion program at the worksite. Table 4.3 illustrates what means of change they were currently using.

Table 4.3 Survey Respondents' Means of Change.

Factor	Yes N (%)	No N (%)
Changing behaviors by myself	155 (96.3)	6 (03.7)
Seeking private help through outside health care	62 (46.3)	72 (53.7)
Going to program outside Chemeketa	27 (23.1)	90 (76.9)
Going to health promotion program at Chemeketa	20 (17.1)	97 (82.9)

The majority (96.3%) indicated that they were attempting to change their behavior without outside assistance. Also, 82.9 percent of the respondents indicated that they were not attending worksite health promotion activities as a means of change.

In a separate but related question, subjects were asked if they had used any of the services offered through the Employee Assistance Program at Chemeketa. While 47 (23.7%) had used these services, the majority of the respondents indicated they had not (76.3%).

Statistical Analysis

Hypothesis One

Ho_1 There will be no significant differences between employee health promotion program participants and nonparticipants for selected sociodemographic variables.

Sociodemographic variables included job classification, marital status, total family income, and number of children in household. Chi-square analyses were performed, comparing participants and nonparticipants for these variables. A cross-tabulation of participants and nonparticipants and the three types of job classifications, including classified, faculty, and exempt (management/administrative), yielded a significant chi-square (df = 2) of 13.37 ($p < .05$). The ratio of participants to nonparticipants differed significantly between these job classifications. As shown in Table 4.4, a greater than expected proportion (75.9%) of exempt employees in the study sample were participants. As expected, classified and faculty employees had nearly equal proportions of participants and nonparticipants.

Table 4.4 Job Classification of Participants and Nonparticipants.

Category	Classified N (%)	Faculty N (%)	Exempt N (%)
Participants	73 (49.7)	56 (49.1)	44 (75.9)
Nonparticipants	74 (50.3)	58 (50.9)	14 (24.1)

Chi-square (df = 2) = 13.37, significant at $p < .05$.

The second sociodemographic variable, marital status, was defined either as single (never married or divorced), separated (married but not living together), married, or not married but living with someone. Since the separated category produced

a cell count of zero, it was combined with the single category for purposes of analysis. The chi-square analysis comparing participation category with marital status revealed no significant differences (chi-square = 5.0, df = 3, p >. 05). Participants and nonparticipants did not differ based upon marital status.

As the third sociodemographic variable, the participation category was also compared with total yearly family income. Chi-square analysis of the comparison revealed that participants and nonparticipants did not significantly differ based upon family income (chi-square = 6.12, df = 5, p >. 05). Finally, participation categories were compared with respect to the number of children in the household, for which variable chi-square analysis revealed no significant differences (chi-square = 3.69, df = 5, p >. 05). The majority of the participant sample (75.1%), as well as the majority of the nonparticipant sample (74.7%), had no children living in the household.

In summary, the chi-square analysis of the first hypothesis indicated that participants and nonparticipants differed significantly only with respect to job classification. Exempt employees were more likely to participate in the health promotion program than were either classified or faculty employees. There were no significant differences between comparison groups with respect to marital status, total family income, or number of children in the household. However, based upon the finding of significant differences among job classifications for participants and nonparticipants, the first null hypothesis was rejected.

Hypothesis Two

Ho_2 There will be no significant differences in health care costs between employee health promotion program participants and nonparticipants.

Health care costs included rates of absenteeism, health insurance paid claim funds, and workers' compensation paid claim funds. The absenteeism data were col-

lected from employer records as the hours taken for sick leave in 1988 and 1989. Health insurance claims cost data were collected from insurer records as major medical and hospital claims paid only for 1989; as previously noted, the data for 1988 were not available due to a change in insurance carriers between the years 1988 and 1989. Workers' compensation claim costs data were also collected from insurer records for 1988 and 1989.

The normality of the participant and nonparticipant distributions for each of these variables was tested using the Kolmogorov-Smirnov Goodness-of-Fit test. In each case, a substantial departure from normality was found. Therefore, a nonparametric test was used to test for the source of the differences between comparison groups. Since the participant and nonparticipant distributions reflected the same shape for all of the variables tested, the nonparametric Mann-Whitney U-test was applied to this null hypothesis based upon equal population parameters.

Chi-square analyses were also conducted to compare the proportions of participants and nonparticipants with respect to the occurrence of absenteeism, health insurance claims, and workers' compensation claims. Participants and nonparticipants were placed in two categories for each comparison variable, based upon whether or not a claim had been paid or an absence had occurred. Those who had at least one health insurance or workers' compensation claim or at least one absence were placed in "yes" categories, and those who had no insurance claims or absences were placed in "no" categories for each of the comparisons. Chi-square analyses revealed that the proportions of participants and nonparticipants taking sick leave were not significantly different for 1988 (chi-square = 0, df = 1, $p > .05$) or for 1989 (chi-square = .66, df = 1, $p > .05$). In addition, based upon the two-year average incidence of sick leave, there were no significant differences between the comparison groups (chi square = .05, df = 1, $p > .05$). Nonparticipants reported no greater number of absences than had participants. Similarly, the Mann-Whitney U-analyses indicated

there were no significant differences between participants and nonparticipants for the number of hours of sick leave taken in 1988 ($Z = -.08$, $p > .05$) and 1989 ($Z = -1.34$, $p > .05$), or for the average number of hours of cumulative sick leave taken during both years ($Z = -.88$, $p > .05$). Therefore, based upon absenteeism data, there were no significant differences between participants and nonparticipants.

The second health care cost variable, health insurance claim dollars, was expressed in the total dollars paid to health care providers in 1989 for two separate claims categories, employee major medical claims and hospital claims. The chi-square analysis revealed that there were no significant differences in the incidence of 1989 major medical claims (chi-square = 1.63, df = 1, $p > .05$) between participants and nonparticipants. Therefore, it could not be determined that nonparticipants incurred greater costs in major medical claims than did participants for 1989. The Mann-Whitney U-test, comparing participant and nonparticipant distributions of medical claims dollars (excluding hospital claims), was not significant ($Z = -1.10$, $p > .05$). Moreover, significant differences were not found when the incidence of participant and nonparticipant 1989 hospital claims were compared (chi-square = .61, df = 1, $p > .05$), and the Mann-Whitney U-test was not significant for hospital claims ($Z = -1.03$, $p > .05$). Based upon these analyses, there were no significant differences between participants and nonparticipants with respect to health insurance claims. Nonparticipants did not file a greater number of or more costly health insurance claims than participants.

The final health care cost variable analyzed was total workers' compensation claim dollars paid to health care providers by the workers' compensation insurance carrier in 1988 and 1989. The chi-analysis of the 1988 data revealed a significant difference (df = 1), 4.07, $p < .05$, in that participants and nonparticipants differed with respect to the incidence of on-the-job injuries or illnesses in 1988. A higher than expected proportion of nonparticipants (6.3%) than participants (1.2%) had

workers' compensation claims in 1988. It was therefore determined that nonparticipants were more likely to suffer a compensable work injury (i.e., 80% of those who filed a claim) than were participants. Findings are indicated in Tables 4.5 and 4.6.

Table 4.5 Workers' Compensation Claims of Participants and Nonparticipants, 1988.

Category	No Claim N (%)	Claim N (%)
Participants	159 (98.8)	2 (1.2)
Nonparticipants	118 (93.7)	8 (6.3)

Chi-square (df = 1) = 4.07, signficant at $p < .05$.

Table 4.6 Workers' Compensation Claims, Percentage by Category, 1988.

Category	No Claim N (%)	Claim N (%)
Participants	159 (57.4)	2 (20.0)
Nonparticipants	118 (42.6)	8 (80.0)

Chi-square (df = 1) = 4.07, significant at $p < .05$.

The Mann-Whitney U-test revealed that the participant distribution for 1988 workers' compensation claim dollars differed significantly from the nonparticipant distribution ($Z = -2.35$, $p < .05$). Of those employees with a compensable claim in 1988 (i.e., two participants and eight nonparticipants), the mean claim dollars paid to participants ($338.16) was much lower than the mean claim dollars paid to nonparticipants ($2,198.35). However, the nonparticipant mean was strongly influenced by one very large claim in 1988.

No significant differences (chi-square= .04, df = 1, $p > .05$) were found

from the analyses of the frequency of workers' compensation claims in 1989 or for the cumulative average frequency of claims in 1988 and 1989 (chi square = 2.88, df = 1, $p > .05$). In addition, the Mann-Whitney U-test did not reveal a significant difference between the distributions for the 1989 data ($Z = -.65$, $p > .05$). However, there was a significant difference between participant and nonparticipant two-year average distributions for workers' compensation claim dollars during the two-year period, 1988 and 1989 ($Z = -2.0$, $p < .05$). Among those subjects with compensable workers' compensation claims paid either in 1988 and/or 1989, the mean dollars paid over both of these years for nonparticipant claims was significantly higher ($994.37) than for participant claims ($109.13). Although it is apparent that the nonparticipants had significantly more costly workers' compensation claims, it should be noted that one unusually high claim in 1988 skewed these distributions. Table 4.7 illustrates these findings.

Table 4.7 Workers' Compensation Claims Costs for Participants and Nonparticipants.

Year	N	Mean Rank	N	Mean Rank	U
1988	161	140.76	126	148.13	9622.0*
1989	173	159.33	146	160.79	12513.5
1988/1989	173	156.64	146	163.99	12047.0*

*Significant at $p < .05$.

Based on the results of the health care cost analysis, the second null hypothesis was rejected. Participants and nonparticipants differed with respect to the incidence of workers' compensation claims paid in 1988 and nonparticipants incurred a greater number of on-the-job injures in 1988. The average for 1988, as well as for the two-year average, 1988-1989, participant and nonparticipant distributions for workers' compensation claims costs also differed significantly. Nonparticipant

workers' compensation claims costs were higher for these years. However, the comparison groups did not differ in absenteeism, health insurance claims, or for 1989 workers' compensation claims.

Hypothesis Three

Ho_3 There will be no significant differences between employee health promotion program participants and nonparticipants for selected health risk behavior variables.

Health risk variables included smoking, alcohol use, physical activity, and eating habits. Health risk data were collected from the administration of the Health Inventory survey, which questioned subjects about the frequency of specific behaviors such as alcohol use, aerobic activity, eating breakfast, minimization of saturated fat and salt intakes, fiber intake, and maintenance of a balanced diet. Chi-square analyses were performed on comparisons between participants and nonparticipants for each of these health risk behavior variables.

A chi-square comparison of the frequency of smoking by participants and nonparticipants produced a significant chi-square value of 15.20 ($df = 4$), $p < .05$. As indicated in Table 4.8, a higher than expected proportion of those subjects who smoked more than 10 cigarettes a day were nonparticipants. Nonparticipant smokers were more likely to be more frequent smokers.

Smoker and nonsmoker categories were created by combining counts from the five smoking frequency categories. Those individuals who reported that they had never smoked or had quit smoking were grouped into a "nonsmoker" category, while the remainder of the respondents from the remaining smoking categories were combined into a "smoker" category. The chi-square analysis comparing participants and nonparticipants for the nonsmoker and smoker categories revealed a significant

Table 4.8 Comparison of Smoking Frequency for Participants and Nonparticipants.					
Category	Never N (%)	Quit N (%)	< 10 N (%)	10-20 N (%)	> 20 N (%)
Participants	85	23	2	1	1
	(66.4)	(51.1)	(40.0)	(11.1)	(25.0)
Nonparticipants	43	22	3	8	3
	(33.6)	(48.9)	(60.0)	(88.9)	(75.0)
Chi-square (df = 4) = 15.20, significant at $p < .05$.					

difference at 9.27 (df = 1), $p < .05$. As shown in Table 4.9, nonparticipants were more likely to be smokers than were participants.

Table 4.9 Smoking Behavior Comparison for Participants and Nonparticipants.		
Category	Nonsmoker N (%)	Smoker N (%)
Participants	108 (62.4)	4 (22.2)
Nonparticipants	65 (37.6)	14 (77.8)
Chi-square (df = 1) = 9.27, significant at $p < .05$.		

No significant differences were found when participants and nonparticipants were compared with respect to frequency of alcohol use (chi-square = 6.63, df = 4, $p > .05$), aerobic activity (chi-square = 6.70, df = 3, $p > .05$), eating breakfast (chi-square = 3.99, df = 4, $p > .05$), minimizing saturated fat intake (chi-square = 2.94, df = 4, $p > .05$), minimizing salt intake (chi-square = 6.20, df = 4, $p > .05$), eating a balanced diet (chi-square = 4.63, df = 4, $p > .05$), or fiber intake (chi-square = 5.45, df = 4, $p > .05$). Majorities from both groups reported that they never or rarely drank alcohol and were physically active, often or very

often ate breakfast, minimized saturated fat and salt intakes, ate balanced diets, and consumed an adequate amount of fiber.

As a result of the significant difference found for the comparison of participants and nonparticipants with respect to frequency of smoking, the third null hypothesis was rejected. Nonparticipants were more likely to smoke and were more likely to be more frequent smokers. However, participants and nonparticipants differed only in smoking behavior; there were no significant differences for the health risk variables for alcohol use, physical activity, and eating habits.

Hypothesis Four

Ho_4 There will be no significant differences between employee health promotion program participants and nonparticipants for health indicator variables.

Health indicator variables included absence due to self-illness, self-rated health status, job satisfaction, job stress, perceived weight, and body mass index. All health indicator variable data were collected from the Health Inventory survey. Absence due to self-illness was reported in the number of days for the two-year period in question. The Kolmogorov-Smirnov Goodness-of-Fit tests for distribution normality found that days of absence were not normally distributed for either participants (K-S $Z = 2.75$, $p < .05$) or nonparticipants (K-S $Z = 2.23$, $p < .05$), both of which were highly skewed in positive directions. Therefore, a nonparametric test was used to test for differences. Since both distributions had the same shape, the nonparametric Mann-Whitney U-test was used to test the null hypothesis, based upon equal population parameters. Chi-square analysis was also used to compare participants and nonparticipants with respect to the incidence of sick leave taken due to the self-illness of the subjects.

From the Health Inventory survey, health status was rated by the respondents

as either excellent, good, fair, or poor. Respondents were also asked to indicate the level of satisfaction with their job as either very satisfied, satisfied, neither satisfied or dissatisfied, dissatisfied, or very dissatisfied. The amount of job stress was rated as not at all, not too, moderately, or very stressful. In comparison to subject perceptions of desirable weights, the respondents described themselves as more than 10 pounds under, 1 to 10 pounds under, at (a desirable weight), 1 to 10 pounds over, or more than 10 pounds over desirable weight. The body mass index (BMI) was calculated from the respondents self-reported heights and weights.[1]

A cross-tabulation of participant and nonparticipant absences yielded a significant chi-square ($df = 1$) of 5.11, $p < .05$. As indicated in Table 4.10, a higher than expected proportion of participants (82.1%) reported that they took sick leave. Therefore, participants were more likely to take sick leave for their own illness than were nonparticipants.

Table 4.10 Self-Reported Absences Due to Self-Illness.

Category	No Claim N (%)	Claim N (%)
Participants	19 (17.9)	87 (82.1)
Nonparticipants	25 (33.8)	49 (66.2)

Chi-square ($df = 1$) = 5.11, significant at $p < .05$.

The Mann-Whitney U-test did not reveal a significant difference between participant and nonparticipant distributions ($Z = -1.84$, $p > .05$). Furthermore, the comparison between participants and nonparticipants with respect to BMI, as analyzed by a two-tailed t-test, resulted in no significant differences ($t = .41$,

[1] $BMI = (weight/2.2) / (height/39.37)^2$.

$p > .05$). Participants had a mean BMI value of 25.79, whereas the nonparticipant mean BMI value was 25.45. Chi-square analyses of the remaining health indicator variables revealed no significant differences between participants and nonparticipants. Neither did participants and nonparticipants differ for self-ratings of their overall health (chi-square = 3.70, df = 2, $p > .05$), satisfaction with their job (chi-square = 5.97, df = 4, $p > .05$), amount of job stress (chi-square = 3.06, df = 3, $p > .05$), or their perceived weight (chi-square = 3.10, df = 4, $p > .05$).

The majority of both participants (60.4%) and nonparticipants (52.6%) rated their overall health as good. Tables 4.11 and 4.12 present the results of subject responses to the question items concerning job satisfaction and job stress.

Table 4.11 Job Satisfaction of Participants and Nonparticipants.

Category	VS N (%)	S N (%)	NS/D N (%)	D N (%)	VD N (%)
Participants	50	51	4	3	1
	(45.9)	(46.8)	(03.7)	(02.8)	(00.9)
Nonparticipants	27	38	8	5	1
	(34.2)	(48.1)	(10.1)	(06.3)	(01.3)

Chi-square (d f= 4) = 5.97, $p > .05$. Note: VS = very satisfied; S = satisfied; NS/D = neither satisfied or dissatisfied; D = dissatisfied; VD = very dissatisfied.

Table 4.12 Job Stress of Participants and Nonparticipants.

Category	NAA N (%)	NT N (%)	M N (%)	V N (%)
Participants	1 (00.9)	22 (20.2)	54 (49.5)	32 (29.4)
Nonparticipants	4 (05.1)	15 (19.0)	37 (46.8)	23 (29.1)

Chi-square (df = 3) = 3.06, $p > .05$; note: NAA = not at all; NT = not too; M = moderate; V = very.

As shown in Table 4.10, the overwhelming majority of both participants and nonpar-

ticipants were either very satisfied or were satisfied with their jobs. Table 4.11 indicates that the majority of both comparison groups reported that their jobs were moderately stressful.

In summary, t-test and chi-square analyses of the fourth hypothesis revealed that participants and nonparticipants differed only with respect to the incidence of absences due to self-illness. Participants were more likely to be absent due to their own illness than were nonparticipants. Therefore, based upon this difference, the fourth null hypothesis was rejected.

Hypothesis Five

Ho_5 There will be no significant differences between questionnaire respondents and nonrespondents for selected sociodemographic variables.

Sociodemographic variables included sex, age, job classification, and participation category. Of the 309 subjects that were mailed questionnaires, 191 (60%) responded with completed returns. The nonrespondents (n=128) were compared to the survey respondents in terms of sex, age, job classification, and participation category, based upon data collected from employee records. Chi-square analyses of these comparisons revealed that the two comparison groups differed only upon the basis of job classification. Survey respondents differed significantly from nonrespondents in proportions for the classified, faculty, and exempt (i.e., management) job classifications (chi-square = 6.86, df = 2, $p < .05$). As indicated in Table 4.13, a higher than expected proportion (74.1%) of the exempt employees responded to the survey and were thus the classification of employees most likely to respond to the survey.

Table 4.13 Job Classification of Survey Respondents and Nonrespondents.			
Category	Classified N (%)	Faculty N (%)	Exempt N (%)
Respondents	87 (59.2)	61 (53.5)	43 (74.1)
Nonrespondents	60 (40.8)	53 (46.5)	15 (25.9)
Chi-square (df = 2) = 6.86, significant at $p < .05$.			

Respondents and nonrespondents were similar for all of the other variables tested for these subject categories. The two groups did not differ by sex (chi-square = .35, df = 1, $p > .05$), age (chi-square = 4.88, df = 4, $p > .05$), or participation category (chi-square = 3.72, df = 1, $p > .05$). Similar proportions of participants and nonparticipants responded to the survey. On the basis of the significant difference found for job classification between survey respondents and nonrespondents, the sixth null hypothesis was rejected. Exempt employees were more likely to respond to the survey than either classified or faculty staff. However, the comparison groups did not differ with respect to the other sociodemographic variables tested (i.e., sex, age, and participation category).

Hypothesis Six

Ho_6 There will be no significant differences between inactive and active subjects for selected health care costs or health risks, or for selected health indicator variables.

Comparative analyses were performed between those subjects who rarely or never engaged in aerobic activity (i.e., inactive subjects) and those subjects who engaged in aerobic activities at least once a week (i.e., active subjects). The two groups of subjects - inactive and active - were compared on the basis of the following variables: two-year average sick leave, major medical claims, hospital claims,

two-year average workers' compensation claims, job stress, job satisfaction, smoking frequency, BMI, and number of children at home. Chi-square analysis indicated a significant difference (chi-square = 4.53, df = 1, $p < .05$) when inactive subjects were compared with active subjects on the basis of the incidence of workers compensation claims. As indicated in Table 4.14, inactive subjects had a much higher than expected frequency of compensable workers' compensation claims.

Table 4.14 Comparison of Workers' Compensation Claims for Inactive and Active Subjects.

Category	No Claim N (%)	Claim N (%)	Expected N (%)
Inactive	31 (17.5)	4 (57.1)	35 (19.0)
Active	146 (82.5)	3 (42.9)	149 (81.0)

Chi-square (df = .1) = 4.53, significant at $p < .05$.

A one-way ANOVA of the mean number of children living at home also revealed a significant difference ($F = 4.66$, $p < .05$). Inactive subjects tended to have more children living at home (mean = 1.17) than did active subjects (mean = .72).

The remaining variables tested by chi-square analyses and/or one-way ANOVA revealed no further significant differences. Therefore, on the basis of these results, inactive and active subjects did not differ on the basis of two-year average sick leave taken, major medical claims, hospital claims, job stress, job satisfaction, smoking frequency, or body mass index. Although the results were not significant, it was found that a greater proportion of inactive subjects were smokers (16.7%) than were active subjects (8.4%). However, inactive and active subjects differed significantly, based upon the proportion of each filing workers' compensation claims and the mean number of children living at home. Therefore, the seventh null hypothesis was rejected.

Other Statistical Tests

To compare the three participation categories, including occasional participants (n=119), regular participants (n=54), and nonparticipants (n=146), on the basis of the sociodemographic, health care cost, reported health risk behavior, and health indicator variables tested for the null hypotheses, all of the statistical tests were repeated . Chi-square analyses revealed significant differences for job class, incidence of workers' compensation claims in 1988, and the smoking behavior of regular, occasional, and nonparticipants.

A much higher than expected proportion of exempt subjects were occasional participants (58.6%), while a much lower than expected proportion were nonparticipants (24.1%). Analysis also revealed that 2.7 percent of the occasional participants, 5.3 percent of the regular participants, and 17.7 percent of the nonparticipants were smokers. Finally, the incidence of workers' compensation claims in 1988 also differed among the three comparison groups. Eighty percent of the nonparticipants filed a workers' compensation claim in 1988, versus only 20 percent of regular participants; none of the occasional participants had compensable claims in 1988.

Two additional significant differences were found among the three group comparisons. A one-way ANOVA comparing the mean number of children living in the households of the three groups revealed there was a significant difference among the three groups ($F = 3.52$, $p < .05$). The multiple-range test of the Student-Newman-Keuls procedure indicated that the difference existed between occasional and regular participants. Occasional participants had more children in the household (mean = .63) than did regular participants (mean=.24). Chi-square analysis revealed there was a significant difference in aerobic activity among occasional, regular, and nonparticipants (chi-square = 29.36, df = 6, $p < .05$). This difference was not ap-

parent in the two-group comparison of aerobic activity. Regular participants were the most active, with 78.3 percent engaging in aerobic activity three or more times each week, whereas 38 percent of occasional participants and 35.5 percent of nonparticipants exercised at that frequency. A summary of these findings is indicated in Table 4.15.

Table 4.15 Aerobic Activity Levels for all Subjects.

Category	Rarely/ Never N (%)	1-2/wk N (%)	3-4/wk N (%)	5/wk N (%)
Occasional	18 (25.4)	26 (36.6)	22 (31.0)	5 (07.0)
Regular	2 (05.4)	6 (16.2)	17 (45.9)	12 (32.4)
Nonparticipants	15 (19.7)	34 (44.7)	22 (28.9)	5 (06.6)

Chi-square (df = 6) = 29.36, significant at $p < .05$.

Summary

This chapter presented answers to the five research questions developed to: 1) examine factors influencing participation and 2) explore differences in health status and health care costs between employee health promotion program participants and nonparticipants. Six null hypotheses were developed and tested to measure differences between comparison groups. Each of the six null hypotheses were tested with one or more of the following statistical tools, dependent upon the type of data collected and its distribution: chi-square analysis, Mann-Whitney U-test, t-test, or one-way ANOVA. In response to the remaining three research questions developed to examine the factors associated with participation, program effects, and health concerns of the study population, descriptive results were also reported. Discussion of these results is included in the following chapter.

The results of the statistical analyses were as follows:

1) The first null hypothesis was rejected because there were significant differences among job classification between participants and nonparticipants;
2) The second null hypothesis was rejected because there were significant differences in workers' compensation claims between participants and nonparticipants;
3) The third null hypothesis was rejected because there were significant differences in frequency of smoking between participants and nonparticipants;
4) The fourth null hypothesis was rejected because there were significant differences in the incidence of absence due to self-illness between participants and nonparticipants;
5) The fifth null hypothesis was rejected because there were significant differences in the job classifications of survey respondents and nonrespondents; and
6) The sixth and final null hypothesis was rejected due to the differences in the incidence of workers' compensation claims and the number of children in the household of active and inactive subjects.

CHAPTER 5

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This study was designed as a comparative analysis of participants and nonparticipants in the employee health promotion program conducted at Chemeketa Community College, Salem, Oregon. Characterizations of participants and nonparticipants, including differences in health status and health care costs between the two groups, were explored. In addition, the characteristics of those who chose to participate and those who did not participate were examined in the effort to determine significant differences between the two self-selected groups. Factors influencing participation in the health promotion program were also examined. Several factors were identified that appeared to hinder or limit participation in the program.

Five major research questions were included for investigation and analysis. This chapter provides a discussion of the findings of this analysis as well as conclusions based upon these findings. This chapter concludes with recommendations for worksite health promotion planning and further study.

Discussion

Descriptive Information on the Total Sample

Selected Psychological Parameters

Analysis revealed that 45 percent of the survey respondents reported that they exercised three or more times a week and that 96 percent indicated that they were changing behaviors on their own without outside assistance. In view of this informa-

tion, the total sample was profiled with respect to health locus of control, self-efficacy, and health beliefs. The particular questions designed to assess these psychological variables were limited due to the length of the questionnaire and the need to measure a broad range of variables. As explained in Chapter 3, these questions were taken from previous research and were intended to be general indicators of these psychological parameters.

Strecher et al. (1986) described health locus of control as expectations about the ability to control one's health. An individual with an internal locus of control believes that health can be controlled by the exercise of personal behaviors, whereas an individual with an external locus of control believes that health is controlled by forces which are external to this ability to exercise self-control. Previous research had suggested that individuals with an internal locus of control orientation were more likely to perform preventive health behavior (Rotter, 1966; Saltzer, 1981). A high degree of self-efficacy was also shown to be indicative of participation in health promotion programs (Alexy, 1991; DiClemente, 1981). Hochbaum (1952) and Rosenstock (1966) found that individuals with high perceived susceptibility to illness and high perceived benefits of positive health behaviors were more likely to practice preventive health behavior.

The mean locus of control scores of the total sample was in an internal direction. This indicates that survey respondents tended to believe that their health was primarily determined by their own behavior. They also had high perceptions of the benefits of positive health habits, high perceptions of the severity of heart disease and cancer, high perceived susceptibility to illness, and a high sense of self-efficacy. Respondents viewed themselves as capable of changing their behavior.

Factors Influencing Participation

The majority of the literature focus upon cost/benefit analyses of health promotion programs. Research directed at an examination of individual issues or factors that influence participation in such programs is limited in extent. This study constituted an initial attempt to identify the characteristics of participants and nonparticipants and the factors that influence participation. However, it has been difficult to isolate and identify specific factors because of the numerous confounding variables. The prediction of participation and adherence is a complex interaction of physical, psychological, and social factors.

From survey responses, several factors appeared to limit participation in the health promotion program. Job schedule, work/activity load, and times of activities appeared to exercise the greatest influence on participation. The majority (64%) of the respondents agreed that their job schedule limited their attendance at health promotion activities, 61 percent didn't participate because they were already overloaded, and 52 percent indicated that the meeting times of the activities were inconvenient. Time constraints appeared to be central to limited participation.

These findings of the limiting effects of available time were further supported by the results of an informal needs assessment survey that was administered to the staff at Chemeketa during September, 1989. The unpublished results of this survey indicated that the majority of the respondents (82%) agreed that the times the activities were offered constituted the greatest barrier to regular participation. The respondents also indicated that they would be more likely to participate if the programs were offered after work or during the lunch hour.

Program Effects

The effect of the health promotion program on the perceived improvement of employee awareness and on selected health behaviors was also assessed by the

administration of the survey. Through a series of yes/no questions, survey respondents were asked if they believed that the health promotion program benefited them or influenced them to make positive changes. The majority of the respondents felt that they had gained more health information (82%) and an increased awareness of health risks (78%). Increased physical activity, improved eating habits, weight control, and stress management were also reported to be program benefits by the survey respondents.

The health promotion program seems to have benefited nonparticipants as well as participants. While only 59 percent of those responding were participants, 43 to 82 percent of the respondents reported the benefits described above. Closing comments gathered as open responses on the questionnaire also indicated that participants and nonparticipants alike were impacted in positive ways by the health promotion program. Many positive comments were made by subjects from both groups, and only positive comments were received from nonparticipants. The following are examples of some of the comments offered by nonparticipants:

"I applaud this effort to increase overall well-being and effectiveness of the Chemeketa community."

"The information received has helped me and my family in many many ways."

"I think it's a great program, many people have really benefited from it . . . ."

"I'm glad it's available, appreciate the information passed out."

This diffused program effect is believed to be due not only to attendance at workshops and seminars, but also to the campus-wide distribution of a health promotion newsletter (HOPE) as well as the emphasis on healthy food choices at campus eating establishments.

Personal Health Concerns/Problems

Survey respondents identified two personal health problems by selecting their first and second greatest health concerns from a list of 15 specific health problems. Overweight/overfat was identified by 27 percent of the respondents as their greatest health concern, whereas 17 percent selected lack of fitness as their second greatest problem. Stress ranked third to both the first and second health problem selections. Based upon the assumption that the respondents would also select these concerns as topics of current interest, this reflects similar findings by Barker and Glass (1990), who found that the greatest topics of interest among university employees were stress, fitness, and nutrition.

As a follow-up to this question, the respondents were asked what they were doing, if anything, about these problems. As a means of change, the majority (96%) indicated that they were attempting to change their behavior without outside assistance. Only 17 percent indicated that they had participated in the health promotion program at Chemeketa. In this sense, an inconsistency is noted since 59 percent of the survey respondents were considered to be program participants. The problem may have been in the interpretation of the phrase, "changing behaviors by myself." Perhaps respondents who earned an incentive by exercising on their own did not consider it "participation" in the health promotion program.

It was also found that only 24 percent of the survey respondents had taken advantage of the Employee Assistance Program. From these results, it would seem that the health promotion program and other assistance programs are failing to reach those with specific health needs and problems.

These results are a key finding of the current study. Nonparticipants reported similar levels of physical activity when compared to participants and reported that they were attempting to make positive changes in their behavior without outside assistance. These individuals may not perceive a need to be involved with the health

promotion program. Perhaps they prefer to participate in activities separate from the workplace and their colleagues. In view of the fact that time constraints were the major hindrance to participation, commuting distance and time may also provide further explanation. These factors could be addressed in future research.

Lovato and Green (1990) suggested that some individuals are able to maintain health practices without attending a worksite program. Some individuals who had previously participated may drop out as they become more independent and require less program support. They may continue on their own or become involved with outside activities.

Group Comparisons

Sociodemographic Differences

A previous study by Rost et al. (1990) found that participants in health promotion programs were more likely to be drawn from management job classifications. In support of this finding, the current study determined that a significantly greater proportion (76%) of exempt employees (i.e., management) were participants in the health promotion program than either classified (50%) or faculty (49%) staff. Lovato and Green (1990) have suggested that a high participation rate among management can have a positive effect on the participation rates of classified staff.

None of the studies reviewed compared participants and nonparticipants with respect to the number of children in the household. However, the results of the current study revealed that regular participants had the lowest mean number of children in the household (.24), while occasional participants had the highest mean number (.63). Active subjects also had significantly fewer children living in the household (mean = .72) when compared to inactive subjects (mean = 1.17). These findings suggest that the number of children living in the household influenced the degree of participation in the employee health promotion program. Those subjects

who participated more frequently and were the most active also had the fewest number of children. Perhaps with fewer children, regular participants may have had fewer family responsibilities and more flexibility in personal time management.

Health Care Cost Differences

Significant differences were found when groups were compared with respect to workers' compensation claims. Data analysis demonstrated that program participants differed significantly from nonparticipants with respect to the incidence of workers' compensation claims. In 1988, a significantly higher proportion (80%) of subjects with compensable workers' compensation claims were nonparticipants. Not only was the incidence of claims higher among nonparticipants, but the mean claims costs were also significantly higher. Nonparticipant claims averaged $2,198 in 1988, whereas participant workers' compensation claims averaged $338. In 1988, nonparticipants were more likely to be injured on-the-job than participants and thus incurred greater claim-related costs. These findings support previous studies by Bowne et al. (1984) and Cady et al. (1985), who also found that health promotion program participants had fewer disabling injuries and fewer disabling absences as well as lower workers' compensation costs than nonparticipants.

While no differences were found for the 1989 data, significant differences were found for the two-year average distributions of claims costs. The average claim costs of nonparticipants were significantly higher ($994) than participant claim costs ($109). These differences in 1988 costs and for the two-year average claims costs should be interpreted with caution due to the small number of comparison subjects and one very costly nonparticipant claim in 1988. This difference in the incidence of workers' compensation claims was also noted when active and inactive subjects were compared with respect to the two-year incidence of claims. Analysis revealed that 11 percent of the inactive subjects had a compensable workers' com-

pensation claim, compared to only two percent of the active subjects. Inactive subjects were more likely to suffer a compensable on-the-job injury than active subjects. This suggests that more active and fit individuals are less likely to be injured on the job. Therefore, increasing physical activity level and improving employee fitness may lead to reduced workers' compensation costs.

Absenteeism and health insurance claims were also analyzed as health care cost variables. Although previous research had suggested that participants in a health promotion program may have lower rates of absenteeism (Bertera, 1990a; Blair et al., 1986; Jones et al., 1990; Wood et al., 1989), this was not supported by the current study. When data collected from the employer's records were analyzed, the hours of sick leave taken by participants and nonparticipants were not significantly different. Nonparticipants took no more sick leave than participants. However, when survey data were analyzed, the proportion of participants reporting absences due to their own illness was significantly higher than nonparticipants.

This inconsistency may also be due to the method of reporting absence data on the questionnaire. The sick leave data analyzed from the questionnaire represented sick leave taken only for the subjects' own illnesses. However, sick leave hours collected from the employer's records included absence for reason of self-illness, illness of children or spouse, and mental health days. As another possible explanation, Lynch et al. (1989) suggested that health risk appraisal responders were more concerned with their health and were thus more likely to seek health services. This may be related to the higher frequency of reported absenteeism found in the present study.

Contrary to earlier studies which have shown lower health insurance claims costs among health promotion program participants (Baun et al., 1986; Bertera, 1990b; Bly et al., 1986; Shepard et al., 1982, 1983), participants and nonparticipants did not differ with respect to the incidence of health insurance claims. Nonpartici-

pants were no more likely to file a health insurance claim or to have more costly claims than participants. A study by Gibbs et al. (1985) provided one possible explanation for the lack of significant differences between participants and nonparticipants with respect to absenteeism and health insurance claim data, noting that while significant differences in health care costs between program participants and nonparticipants did not occur over a short-term analysis (i.e., six months), in the long-term (i.e., five years) there was a significant reduction in the health care costs of participants. The current study examined only data for the two years 1988 and 1989. This may not be have been an adequate period of time for differences to be registered for these health care cost variables. In addition, these variables were not analyzed with respect to changes that may have occurred within each group from 1988 to 1989.

Differences in Health Risk Behaviors

The results of the analysis of participant and nonparticipant health risk behaviors were consistent with observations by Alexy (1990, 1991), Shepard et al. (1980), and Conrad (1987, 1988), who found that participants in health promotion programs tended to be nonsmokers. The current analysis revealed that a significantly greater proportion of nonparticipants were smokers (18%) than were participants (4%). In addition, nonparticipants smoked more frequently than the participants who smoked. Of those who smoked 10 or more cigarettes a day, 85 percent were nonparticipants. Thus, nonparticipants were more likely to be smokers and to smoke more frequently than participants.

Findings by Baun et al. (1986) and Shephard et al. (1980) indicating that participants in employee health promotion programs tended to be exercisers were not supported by the current study. Participants and nonparticipants did not differ with respect to levels of physical activity. However, though there were no significant dif-

ferences between participants and nonparticipants, the three-group comparison of regular participants, occasional participants, and nonparticipants did reveal a significant difference. A significantly higher proportion of regular participants (78%) engaged in aerobic exercise three or more times each week than did occasional participants (38%) or nonparticipants (36%). Considering that participants who were more physically active were classified as regular participants, this difference was not an exceptional finding. When occasional and regular participants were combined into a single participant category, the proportion exercising three or more times each week was reduced to 52 percent. In addition, 36 percent of the nonparticipants reported exercising on their own at that frequency, but had not been participants in the incentive program or in staff aerobics programs. This would appear to provide a reason for the lack of difference found in the two-group comparison with respect to the level of physical activity. This lack of clear distinction between participants and nonparticipants with respect to physical activity was a significant limitation of the study.

No further differences were revealed in the analysis of health risk behaviors. Participants and nonparticipants did not differ in alcohol use or eating habits. With the exception of smoking behavior, Conrad (1988) also found relatively few lifestyle and health differences between participants and nonparticipants. Settergren et al. (1983) concluded that health screening responders did not differ dramatically from nonrespondents.

Health Status Differences

Other than the differences in absence discussed earlier, no differences in the health status between participants and nonparticipants were found in this investigation. Participants and nonparticipants did not differ with respect to self-rated health status, job satisfaction, job stress, perceived weight, or body mass index. Although

Alexy (1990) and Conrad (1988) found that participants rated their health status significantly higher than nonparticipants, the current study found that both nonparticipants and participants rated their overall health as good. However, Conrad further found that participants and nonparticipants did not differ in overall stress or job satisfaction. Similarly, no differences were found in job satisfaction or job stress between participants and nonparticipants. Participants as well as nonparticipants indicated that their jobs were moderately stressful, yet both groups were satisfied with their jobs.

Conclusions

Based on the results of this study, the following conclusions apply to the specific population analyzed for the present study:

1. Survey responses suggested that the respondents believed that their helath was primarily determined by their own behavior. It also appeared that the survey respondents had a high sense of self-efficacy.

2. The greatest influences on participation were related to the availability of time and personal convenience. Job schedules, work/activity loads, and times of the activities were reported to be the greatest barriers to participation in the employee health promotion program.

3. Survey respondents reported that the health promotion program had the greatest impact on their perceived acquisition of health information and their perceived increase in awareness of health risks. Other reported benefits included increased physical activity, improved eating habits, weight control, and stress management. These benefits were noted by both participants and nonparticipants.

4. Survey respondents identified overweight/overfat, lack of fitness, and stress as their greatest personal health concerns or problems. The majority of the

respondents also indicated that they were attempting to change their health behaviors without outside assistance.

5. Compared to faculty and classified employees, a greater proportion of management employees participated in the health promotion program and responded to the Health Inventory survey. These exempt employees were more likely to be involved with and to participate in the health promotion program.

6. It appeared that the number of children living in the household influenced the level of physical activity and the degree of participation in the health promotion program. This research suggests that those subjects with the highest levels of participation and activity levels also had the lowest mean number of children in the household.

7. There was no statistical support for lower rates of absenteeism among program participants. In fact, when data from the employer's records were analyzed, participants and nonparticipants did not differ with respect to sick leave taken. However, a difference was found when self-reported absences collected from the survey information was analyzed. Participants reported a greater frequency of absences due to their own illness than did nonparticipants.

8. Participants and nonparticipants did not differ with respect to health insurance claim costs or incidence. Nonparticipants were not more likely than participants to file a health insurance claim or to have more costly claims.

9. Health promotion program participants and nonparticipants differed with respect to the incidence of workers' compensation claims. In 1988, a much higher proportion of subjects with workers' compensation claims were nonparticipants. The data suggested that nonparticipants were more likely to be injured on the job in 1988. In addition to the difference in incidence, 1988 claims costs and the two-year average costs were higher among nonparticipants as well. Differences in the incidence of workers' compensation claims over both study years were found when

inactive and active subjects were compared. Active employees engaging in aerobic exercise at least once each week were less likely to be injured on the job.

10. Participants in the health promotion program were more likely to be nonsmokers, and a greater proportion of nonparticipants were smokers. Furthermore, of those who smoked more frequently, a greater proportion were nonparticipants. Therefore, nonparticipants were more likely to be smokers and to smoke more frequently than participants.

11. The analysis of health status indicators did not reveal significant differences between participants and nonparticipants with respect to perceived health, job satisfaction, job stress, and perceived weight. The average body mass index scores for participants and nonparticipants were not significantly different.

Recommendations

Based upon the findings from this study, the following recommendations are provided :

1. To provide a better profile of participants and nonparticipants, a more definitive method of distinguishing these two groups is recommended. The minimum requirements for participant status should be increased. Survey information and/or in-depth interviews, in addition to the employers' records, should be used to categorize subjects. Given this information, those who participate in workplace activities and those who are active on their own could also be profiled.

2. Recognizing that many nonparticipants and participants practice preventive health behaviors on their own, the health promotion program should encompass activities outside of the workplace. Participation in more convenient outside programs should be encouraged and facilitated.

3. Due to the broad range of variables analyzed, the current study was limited to a cursory examination of factors influencing participation, psychological characteristics, health risk behaviors, and the health status of the comparison groups. Future research should examine a narrower range of variables in an in-depth manner.

4. Survey respondents reported that they felt that they gained new health information and were more aware of health risks. Future research is needed to test and validate this perceived gain in health information and awareness.

5. Further research and ongoing evaluation must be established that provide feedback to employees and assesses program effectiveness. The evaluation procedures should encompass employee health status and behavior changes. Appropriate experimental or quasi-experimental designs should be used to assess program effectiveness and impacts upon employee health and health care costs. Methodologically sound evaluations are required to ensure both the accuracy and validity of the assess-

ment of cost savings to the organization.

A longitudinal study tracking changes within participating and nonparticipating groups, as well as between groups, over a longer period of time is therefore recommended. A nonparticipating comparison group could be selected as a control from a separate organization or business to provide a more accurate assessment of program effectiveness.

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APPENDICES

Appendix A

Chemeketa Health Inventory Pilot Survey

CHEMEKETA HEALTH INVENTORY

Circle one number for each answer:

1. During 1988 and/or 1989, which of the following health promotion activities offered at Chemeketa, if any, did you participate in?

	YES	NO
a. Health/Fitness Assessment	1	2
b. Incentive Program	1	2
c. Staff Aerobics	1	2

d. Other (please specify):_____

2. Please indicate the degree to which you agree or disagree with each of the following statements regarding your participation in any health promotion activities (circle one number for each):

	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a. The meeting times of the activities were generally inconvenient for me	1	2	3	4	5
b. The costs of activities made it difficult for me to attend	1	2	3	4	5
c. I was unable to attend activities offered before or after work because of a lack of child care	1	2	3	4	5
d. I was unaware of activities	1	2	3	4	5
e. Activities were offered in inconvenient locations	1	2	3	4	5
f. I did not participate because of a lack of family/social support	1	2	3	4	5
g. I didn't attend activities because I had no one to go with	1	2	3	4	5
h. I have a physical limitation which prohibits me from participating	1	2	3	4	5
i. My job schedule limits my attendance	1	2	3	4	5
j. I don't participate because I am already overloaded	1	2	3	4	5
k. I would prefer to go to activities or programs not related to my job or the people I work with	1	2	3	4	5
l. The activities don't meet my needs	1	2	3	4	5
m. I have no desire or interest in participating	1	2	3	4	5

n. Other reasons you did not attend some or any of the activities (please specify if any):_____

3. In what ways, if any, has the health promotion program at Chemeketa benefited you or influenced you to make positive changes in your health behaviors? (circle one number for each)

	DOESN'T APPLY	NO	YES
a. Stopped smoking	1	2	3
b. Increased physical activity	1	2	3
c. Weight control	1	2	3
d. Improved eating habits	1	2	3
e. Stress management	1	2	3
f. Provided new information	1	2	3
g. More aware of health risks	1	2	3

f. Other (please specify):_____

4. Have you used any of the services offered through the Employee Assistance Program at Chemeketa? (circle one number)

   1 NO
   2 YES

5. How satisfied or dissatisfied are you with your job?

   1 VERY SATISFIED
   2 SATISFIED
   3 NEITHER SATISFIED OR DISSATISFIED
   4 DISSATISFIED
   5 VERY DISSATISFIED

6. How stressful is your job?

   1 NOT AT ALL STRESSFUL
   2 NOT TOO STRESSFUL
   3 MODERATELY STRESSFUL
   4 VERY STRESSFUL

7. How often do you get at least 20 minutes of continuous aerobic activity - such as jogging, swimming, walking, biking, etc....?

   1 RARELY OR NEVER (GO ON TO QUESTION 8)
   2 ONE OR TWO TIMES PER WEEK
   3 THREE OR FOUR TIMES A WEEK
   4 FIVE OR MORE TIMES A WEEK

   7a. Through what program do you get most of your exercise?

      1 CHEMEKETA PROGRAM
      2 HEALTH/FITNESS CLUB OR PROGRAM OUTSIDE OF CHEMEKETA
      3 ON MY OWN
      4 OTHER (PLEASE SPECIFY):_____

8. Do you smoke cigarettes?

   1 NO, NEVER SMOKED OR ONLY TRIED
   2 NO, I USED TO SMOKE BUT QUIT
   3 YES, I SMOKE LESS THAN 10 CIGARETTES A DAY
   4 YES, I SMOKE BETWEEN 10 AND 20 CIGARETTES A DAY
   5 YES, I SMOKE MORE THAN 20 CIGARETTES A DAY

9. On the average, how many days a week, if at all, do you have at least one drink of alcohol (beer, wine, or liquor)?

   1 NEVER (GO ON TO QUESTION 10)
   2 RARELY DRINK
   3 1 - 2 DAYS A WEEK
   4 3 - 5 DAYS A WEEK
   5 ALMOST EVERYDAY

   9a. On the days that you drink, how many drinks do you usually have?

      1 ONE TO TWO DRINKS
      2 THREE TO FIVE DRINKS
      3 SIX TO NINE DRINKS
      4 TEN OR MORE DRINKS

10. How would you best describe yourself?

   1 VERY UNDERWEIGHT, TOO THIN
   2 UNDERWEIGHT
   3 DESIRABLE WEIGHT
   4 SLIGHTLY OVERWEIGHT
   5 VERY OVERWEIGHT

11. Please indicate whether the following statements describe your current eating habits (circle one for each):

		ALWAYS	VERY OFTEN	OFTEN	SOME-TIMES	RARELY
a.	I eat breakfast	1	2	3	4	5
b.	I minimize my intake of saturated fats	1	2	3	4	5
c.	I minimize salt intake	1	2	3	4	5
d.	I eat a balanced diet which includes foods from all four food groups	1	2	3	4	5
e.	My diet includes an adequate supply of fiber	1	2	3	4	5

12. How would rate your overall health? (circle one number)

1 EXCELLENT
2 GOOD
3 FAIR
4 POOR

13. From the following list, identify your current TWO major health problems that concern you personally by placing the number in the appropriate space below.

_____FIRST GREATEST CONCERN
_____SECOND GREATEST CONCERN

01 High blood pressure
02 Stress
03 Smoking
04 Lack of fitness
05 Cancer
06 Back problems
07 Concerns with aging
08 High blood cholesterol
09 Overweight/Overfat
10 Family issues
11 Other relationships
12 Depression
13 Alcohol use
14 Chemical dependency
15 Heart health
16 Other(please specify):_____

14. Are you doing anything about these health concerns? (circle one number)

1 NO, DOING NOTHING (GO ON TO QUESTION 15)
2 YES, I AM DOING SOMETHING

14a. Please indicate what you are currently doing about these health concerns (circle one number for each):

		YES	NO
a.	Changing behaviors by myself	1	2
b.	Going to a health promotion program at Chemeketa	1	2
c.	Seeking private help through outside health care (counseling, physician, etc)	1	2
d.	Going to an outside program (the Y, Courthouse, support groups, etc)	1	2
e.	Other (please specify):_____		

15. Please indicate the number of days of sick leave you took during 1988 and 1989 for each of the following reasons (if none write "0"):

_____YOUR OWN ILLNESS

_____SICK CHILD

_____SICK RELATIVE, SPOUSE/SIGNIFICANT OTHER

_____MENTAL HEALTH DAY (NEEDED A DAY OFF)

16. Please indicate the degree to which you agree or disagree with each of the following statements (circle one number for each):

		STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a.	Good health is largely a matter of good fortune .	1	2	3	4	5
b.	No matter what I do, if I am going to get sick, I will get sick	1	2	3	4	5
c.	Peoples ill health results from their own carelessness	1	2	3	4	5
d.	If I take care of myself, I can avoid illness . .	1	2	3	4	5
e.	I feel unable to change my health behaviors . . .	1	2	3	4	5
f.	There is no point in trying to change my habits, I'll just fail anyway	1	2	3	4	5
g.	It is unlikely that I will develop a serious illness in the next 5 years	1	2	3	4	5
h.	Positive health habits will reduce my chances of becoming ill	1	2	3	4	5
i.	Making changes in my health behaviors now probably won't help, most of the damage is already done	1	2	3	4	5
j.	The consequences of developing heart disease or cancer would be very severe	1	2	3	4	5

17. What is your marital status? (circle one number)

1 SINGLE OR DIVORCED
2 SEPARATED (MARRIED BUT NOT LIVING TOGETHER)
3 MARRIED
4 NOT MARRIED, BUT LIVING WITH SOMEONE

18. What is you total family income?

1 LESS THAN $11,999/YR
2 $12,000 - $19,999/YR
3 $20,000 - $34,999/YR
4 $35,000 - $49,999/YR
7 $50,000 - $64,999/YR
8 MORE THAN $65,000/YR

19. How many children, if any, living in your household are in the following are groups? (if none indicate with a "0")

_____5 YEARS OLD OR YOUNGER
_____6 - 12 YEARS OLD
_____13 - 19 YEARS OLD
_____20 - 30 YEARS OLD
_____31 YEARS OLD OR OLDER

20. What is your current height and weight?

HEIGHT: _____ft. _____in. WEIGHT: _____lbs.

Is there anything else you would like to say about the Health Promotion Program here at Chemeketa?_____

THANK YOU FOR YOUR INPUT!

Appendix B

Chemeketa Health Inventory

CHEMEKETA HEALTH INVENTORY

Circle one number for each answer:

1. During 1988 and/or 1989, which of the following health promotion activities offered at Chemeketa, if any, did you participate in? (circle one for each)

	YES	NO
a. Health/Fitness Assessment	1	2
b. Incentive Program	1	2
c. Staff Aerobics	1	2

d. Other (please specify):_____

2. Please indicate the degree to which you agree or disagree with each of the following statements regarding your participation in any health promotion activities (circle one number for each):

	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DOESN'T APPLY
a. I did not attend activities because I am off campus most of the time	1	2	3	4	5
b. The meeting times of the activities were generally inconvenient for me	1	2	3	4	5
c. The costs of activities made it difficult for me to attend	1	2	3	4	5
d. I was unable to attend activities offered before or after work because of a lack of child care	1	2	3	4	5
e. I was unaware of activities	1	2	3	4	5
f. Activities were offered in inconvenient locations	1	2	3	4	5
g. I did not participate because of a lack of family/social support	1	2	3	4	5
h. I didn't attend activities because I had no one to go with	1	2	3	4	5
i. I have a physical limitation which prohibits me from participating	1	2	3	4	5
j. My job schedule limits my attendance	1	2	3	4	5
k. I don't participate because I am already overloaded	1	2	3	4	5
l. I would prefer to go to activities or programs not related to my job or the people I work with	1	2	3	4	5
m. The activities don't meet my needs	1	2	3	4	5
n. I have no desire or interest in participating	1	2	3	4	5

o. Other reasons you did not attend some or any of the activities (please specify if any):_____

3. In what ways, if any, has the health promotion program at Chemeketa benefited you or influenced you to make positive changes in your health behaviors? (circle one number for each)

	YES	NO	DOESN'T APPLY
a. Stopped smoking	1	2	3
b. Increased physical activity	1	2	3
c. Weight control	1	2	3
d. Improved eating habits	1	2	3
e. Stress management	1	2	3
f. Provided new information	1	2	3
g. More aware of health risks	1	2	3

f. Other (please specify):_____

4. Have you used any of the services offered through the Employee Assistance Program (EAP) at Chemeketa - Cascade Counseling, ect.? (circle one number)

1 NO
2 YES

5. How satisfied or dissatisfied are you with your job?

1 VERY SATISFIED
2 SATISFIED
3 NEITHER SATISFIED OR DISSATISFIED
4 DISSATISFIED
5 VERY DISSATISFIED

6. How stressful is your job?

1 NOT AT ALL STRESSFUL
2 NOT TOO STRESSFUL
3 MODERATELY STRESSFUL
4 VERY STRESSFUL

7. How often do you get at least 20 minutes of continuous aerobic activity - such as jogging, swimming, walking, biking, etc....?

1 RARELY OR NEVER (GO ON TO QUESTION 8)
2 ONE OR TWO TIMES PER WEEK
3 THREE OR FOUR TIMES A WEEK
4 FIVE OR MORE TIMES A WEEK

7a. Through what program do you get most of your exercise?

1 CHEMEKETA PROGRAM FOR STAFF
2 CHEMEKETA P.E. CLASSES FOR STUDENTS
3 HEALTH/FITNESS CLUB OR PROGRAM OUTSIDE OF CHEMEKETA
4 ON MY OWN

8. Do you smoke cigarettes?

1 NO, NEVER SMOKED OR ONLY TRIED
2 NO, I USED TO SMOKE BUT QUIT
3 YES, I SMOKE LESS THAN 10 CIGARETTES A DAY
4 YES, I SMOKE BETWEEN 10 AND 20 CIGARETTES A DAY
5 YES, I SMOKE MORE THAN 20 CIGARETTES A DAY

9. On the average, how many days a week, if at all, do you have at least ONE drink of alcohol (beer, wine, or liquor)?

1 NEVER (GO ON TO QUESTION 10)
2 RARELY DRINK
3 1 - 2 DAYS A WEEK
4 3 - 5 DAYS A WEEK
5 ALMOST EVERYDAY

9a. On the days that you drink, how many drinks do you usually have?

1 ONE TO TWO DRINKS
2 THREE TO FIVE DRINKS
3 SIX TO NINE DRINKS
4 TEN OR MORE DRINKS

10. How would you best describe yourself?

1 MORE THAN 10 POUNDS UNDER DESIRABLE WEIGHT
2 ONE TO TEN POUNDS UNDER DESIRABLE WEIGHT
3 AT A DESIRABLE WEIGHT
4 ONE TO TEN POUNDS OVER DESIRABLE WEIGHT
5 MORE THAN 10 POUNDS OVER DESIRABLE WEIGHT

11. Please indicate whether the following statements describe your current eating habits (circle one for each):

		ALWAYS	VERY OFTEN	OFTEN	SOME-TIMES	RARELY
a.	I eat breakfast	1	2	3	4	5
b.	I minimize my intake of saturated fats	1	2	3	4	5
c.	I minimize salt intake	1	2	3	4	5
d.	I eat a balanced diet which includes foods from all four food groups	1	2	3	4	5
e.	My diet includes an adequate supply of fiber	1	2	3	4	5

12. How would you rate your overall health? (circle one number)

1 EXCELLENT
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4 POOR

13. From the following list, identify your current TWO major health problems that concern you personally by placing the number in the appropriate space below.

_____FIRST GREATEST CONCERN
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01 High blood pressure
02 Stress
03 Smoking
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05 Cancer
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07 Concerns with aging
08 High blood cholesterol
09 Overweight/Overfat
10 Family relationship problems
11 Other relationship problems
12 Depression
13 Alcohol use
14 Chemical dependency
15 Heart health
16 Other(please specify):_____

14. Are you doing anything about these health concerns? (circle one number)

1 NO, DOING NOTHING (GO ON TO QUESTION 15)
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14a. Please indicate what you are currently doing about these health concerns (circle one number for each):

		YES	NO
a.	Changing behaviors by myself	1	2
b.	Going to a health promotion program at Chemeketa	1	2
c.	Seeking private help through outside health care (counseling, physician, etc)	1	2
d.	Going to an outside program (the Y, Courthouse, support groups, etc)	1	2
e.	Other (please specify):_____		

15. On each blank below, please indicate the number of days of sick leave you took during 1988 and 1989 for the following reasons (if none write "0"):

_____YOUR OWN ILLNESS

_____SICK CHILD

_____SICK RELATIVE, SPOUSE/SIGNIFICANT OTHER

_____MENTAL HEALTH DAY (NEEDED A DAY OFF)

16. Please indicate the degree to which you agree or disagree with each of the following statements (circle one number for each):

		STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
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b.	No matter what I do, if I am going to get sick, I will get sick	1	2	3	4	5
c.	People's ill health results from their own carelessness	1	2	3	4	5
d.	If I take care of myself, I can avoid illness	1	2	3	4	5
e.	I feel unable to change my health behaviors	1	2	3	4	5
f.	There is no point in trying to change my habits, I'll just fail anyway	1	2	3	4	5
g.	It is unlikely that I will develop a serious illness in the next 5 years	1	2	3	4	5
h.	Positive health habits will reduce my chances of becoming ill	1	2	3	4	5
i.	Making changes in my health behaviors now probably won't help, most of the damage is already done	1	2	3	4	5
j.	The consequences of developing heart disease or cancer would be very severe	1	2	3	4	5

17. What is your marital status? (circle one number)

1 SINGLE OR DIVORCED
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3 $20,000 - $34,999/YR
4 $35,000 - $49,999/YR
7 $50,000 - $64,999/YR
8 MORE THAN $65,000/YR

19. On each blank below, please indicate the number of children, if any, that are living in your household in the following age groups (if none indicate with a "0"):

_____5 YEARS OLD OR YOUNGER
_____6 - 12 YEARS OLD
_____13 - 19 YEARS OLD
_____20 - 30 YEARS OLD
_____31 YEARS OLD OR OLDER

20. What is your current height and weight?

HEIGHT: _____ft. _____in. WEIGHT: _____lbs.

Is there anything else you would like to say about the Health Promotion Program here at Chemeketa?_____

_____

_____

THANK YOU FOR YOUR INPUT!