EVALUATION OF A SELECTED HEALTH RISK APPRAISAL PROGRAM

By

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EVALUATION OF A SELECTED HEALTH

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CHAPTER I

INTRODUCTION

Hundreds of billions of dollars are spent annually in this country on diseases and conditions that are preventable to a significant degree (Fielding, 1984). According to the President's Council on Physical Fitness, premature deaths alone cost American industry more than $25 billion and 132 workdays of lost production each year (Fielding, 1984).

In the past decade, worksite wellness programs have emerged as a manifestation of the growing national interest in disease prevention and health promotion (Conrad, 1987). Surveys have shown that more than 20% of companies with at least 50 to 100 employees offer some type of health promotion activity (Conrad, 1987).

Health Risk Appraisals (HRA) are popular components of many health promotion programs. An HRA can be an inexpensive way of conducting a needs assessment at a worksite to help the company recognize the degree of preventable illness in its employee population that might be modified by risk reduction programs (Bellingham, 1987). A typical health appraisal asks questions about habits such as

smoking, diet, and exercise, and some physiological data such as weight and blood pressure. Computer analysis compares the individuals' responses to a database of epidemiological and mortality statistics and then produces a profile showing his or her health risk factors that increase the individual's risk for each serious health problem or disease (Bellingham, 1987).

Health risk appraisal programs are a series of worksite health promotion products and services offered to business, industry, and health care providers. One particular health risk appraisal program has served more than 24,000 employees within one organization as well as many other firms throughout the United States (CDC, 1984). This health risk program offers a full range of ready-to-implement components such as health screening, health risk profile, lifestyle change courses, program consulting, needs assessment, and others which are available separately or as a package. Its premises are as follows: 1) lifestyle has a major effect on illness and life span; 2) with appropriate help, people can change their behavior; 3) the workplace is the most effective place to do this because people spend so much of their time there; and 4) companies have a major stake in promoting a healthier lifestyle for their employees, with potential benefits of reduced insurance costs, decreased absenteeism, improved productivity and better morale (McCann, 1981).

Risk appraisal is still in the early stages of development. Researchers are working to update the statistical database and improve the methods used to compute risk factors (Bellingham, 1987). They are concerned about the effectiveness of these tools. Do they really motivate people to change their behavior or is it inappropriate to consider them as behavior change instruments? (Bellingham, 1987).

Research attention has focused primarily on such questions as effectiveness of health promotion programs, controlling health care costs and reducing absenteeism and turnover rates, but actual evaluation of health appraisal programs is less common. Much of the evaluative literature within health promotion has focused on specific program evaluation such as smoking cessation programs and weight management programs; it does not address the broader issue of a health appraisal program in the worksite leading to positive changes in health practices among a large group of employees (Kronenfeld, 1987).

Studies on participation in wellness programs are limited; relatively little attention has been paid to who participates in wellness programs, and, conversely, who does not participate (Conrad, 1987). The question of who comes to worksite wellness programs is significant for several reasons. One is to find out if wellness programs attract mostly employees who are already generally fit and healthy

or employees who are deemed "at risk" for disease (Davis, 1984). Do they attract participants from the entire spectrum of company employees or do they come predominantly from certain sectors of the company? Lastly, are the participants representative of the majority population in the workplace? Answers to these questions will have implications for how successful programs are in reducing risk among an employee population (Davis, 1984).

There is a need for further research in the evaluation of health risk appraisal programs in the workplace to find out if they, in fact, cause positive changes in health care practices and to find out who participates in these health programs. Then alterations, if any, can be made to make health risk appraisals more feasible, available, acceptable, and serviceable to the business industry.

Statement of the Problem

The purposes of this study were to identify the employee population most likely to participate in a selective health risk appraisal, to identify the major health risks and projected causes of death among public state agency employees, and to determine if employees made any substantial health changes to improve their quality of life over a one-year period.

Research Questions

The following research questions were investigated:

1. What was the difference (if any) in the representation of participants volunteering in the first or second screenings?

2. What was the direction of change (if any) between the first and second groups on employees health risk appraisals relating to health risks factors and projected causes of death?

Limitations

The research may be affected by the following limitations:

1. This study was limited to 164 (1986) and 49 (1987) male and female employees who volunteered out of a total of 309 employees.

2. This study was limited by the accessibility to company health care costs and other personnel records.

3. This study was limited by this health risk appraisal's criteria selected for this study.

Delimitations

The research was delimited to a volunteer group of men and women employees at the Oklahoma State Department of Vocational and Technical Education in Stillwater, Oklahoma enrolled in the health risk appraisal program.

Assumptions

The following assumptions were made:

1. The first assumption was that the testing conditions and procedures were equal for all subjects during the health risk appraisal screening.

2. The second assumption was that all volunteered employees answered their questionnaires honestly and completely.

Definitions of Terms

In order to understand the meaning of terms used in this study, the following definitions are classified as conceptual or functional. Conceptual definitions include those terms defined by authorities. Functional definitions include those terms which hold special meaning for this study.

Conceptual Definitions

The following were categorized as conceptual definitions:

1. Health Risk Appraisal: Health promotional technique in which an individual's health-related behavior and personal characteristics are compared to mortality statistics and epidemiological data. The results are used to estimate the individual's risk of dying by some specified future time along with the amount of

that risk which could be eliminated by making appropriate behavioral changes (Bailey, 1985). Method/tool which describes an individual's chance of becoming ill or dying from a select cause over a specified period of time as compared to people of the same age, race and sex (CDC, 1982).

2. Lifestyle: All those behaviors over which we do have control, including those actions which affect our health risks as stated by Ardell (Bailey, 1985).
3. Wellness: An active process through which individuals become aware of and make choices toward a more successful existence and quality of life which is divided into six dimensions: social, occupational, spiritual, physical, intellectual, and emotional (Hettler, 1984).
4. Health Risk Factors: Characteristics that increase the risk of each serious health problem. These include smoking, high blood pressure, elevated serum cholesterol, diabetes, obesity, lack of exercise, type A behavior, alcohol, solar radiation, worksite hazards, diet, nonuse of seat belts, hand gun availability, drug misuse, and stress (Fielding, 1984).

Functional Definitions

1. Health Promotion: An approach to reduce illness and promote health (Bellingham, 1987). Health promotion

refers to a broad variety of activities and services, including risk reduction classes, testing, health hazard assessments, fitness activities, and physical exams (Ardell, 1977).

2. Worksite: Place at which employees work and spend much of their time, making it a major place for promoting a healthier lifestyle, with potential benefits of reduced absenteeism, reduced insurance cost, improved productivity, and better morale (Conrad, 1987).
3. Epidemiological Data: Data accumulated by studying a population group over a period of time and measuring certain characteristics such as height, weight, blood pressure, and habits, and then deciding what diseases those habits were associated with (Berry, 1981).
4. Risk Age: Individual's age when comparing their current health risk factors with others of the same age (CDC, 1982). A risk age higher than a person's chronological age means that the person has one or more health risk factors increasing their risk of death and a lower risk age means the person has health risk factors below the average of other people their age (CDC, 1982).

CHAPTER II

SELECTED REVIEW OF LITERATURE

The review of the literature in this chapter consists of five sections: (a) health risk appraisals, (b) health risk factors and projected causes of death, (c) health promotion programs, (d) participation in worksite wellness programs, and (e) Control Data Corporation's StayWell risk profile.

Health Risk Appraisals

A health hazard-health risk appraisal describes a person's chances of becoming ill or dying from a particular disease within a certain period, identifying poor health practices, and then motivating the person to change his or her behavior. The capacity of the appraisal to modify behavior has not yet been fully assessed; however, a health risk appraisal is likely to be most effective if it is linked to other intervention programs (Bellingham, 1987). The health risk appraisal is a health promotional tool that takes an individual's health-related behaviors and personal characteristics and compares them to mortality statistics and epidemiological data. The results of the appraisal are used to estimate the individual's risk of dying in some specified

future time along with the amount of that risk which could be eliminated by making appropriate behavioral changes. It is designed to show how a person can avoid the most common causes of death considering age, race, and sex (Bailey, 1985). The health risk appraisal is not a proven tool to increase knowledge, participation, motivation, or changes in health-related behavior morbidity and mortality outcomes on its own (CDC, 1984). Since the health risk appraisal is only an information and motivational tool, it is unlikely that behavior changes required to reduce health risks will occur without follow-up and referral to appropriate resources (Wendy Fink Associates, 1986).

Computerized health risk appraisals provide information not only for individual employees but also to the company via a composite summary of all results generated. These results are compared to a national data base derived from epidemiological studies, clinical observations, and actual analyses (Wendy Fink Associates, 1986). It provides information on which risk factors are most prevalent at a particular worksite, while maintaining the individual's confidentiality (Wendy Fink Associates, 1986).

A health risk appraisal provides an estimate of the chances of experiencing an illness or premature death. There are many unknown factors which can influence personal health and life expectancy, so the presence or absence of risk factors is no guarantee that an illness will or will not develop (Wendy Fink Associates, 1986).

The appraisal can be an annual event where employees who took the test one year will want to be retested in subsequent years to compare their data in order to measure their progress from year to year (Wendy Fink Assoc., 1986). The health risk appraisal tool can be used both as a motivational device for stimulating behavioral change and as a tool for structuring education about health-related behaviors (Bailey, 1985).

The value of the health risk appraisal in motivating employees to improve their health practices can be assessed by comparing the average variance of present age with risk age between the initial testing and annual retesting (Bailey, 1985). Programs are needed to help workers change their behavior. Programs attempting to change behavior and improve health are in need of effective tools. The health risk appraisal tools may require many revisions before perfected, but it is a beginning (Bailey, 1985).

The StayWell Health Risk Appraisal is one such tool. The information filled out by each individual in the 100 item questionnaire is compared by computer to national statistics about the effect of the same characteristics for people of the same age, sex, and race. The information is then presented to the individual in a sealed booklet known as the health risk profile. The profile presents information that indicates the individual's risk of death over the next ten years, provided their health behaviors remain constant (CDC, 1982). This helps the individual realize the influence

their health risks have on their survival potential. Repeated studies have confirmed that most serious chronic health problems are a reflection of a person's lifestyle pattern (CDC, 1982). The profile identifies certain lifestyle patterns and other health risks that can be connected to health problems and offers alternatives that will promote risk reduction (CDC, 1982).

Health Risk Factors and Projected Causes of Death

Lifestyle accounts for 53% of deaths of Americans before age 65. Therefore, lifestyle changes represent the area where the greatest impact on health can be made (Bailey, 1985).

In 1906, President Theodore Roosevelt appointed a committee of 100 to study the "national vitality." After two years of research, the committee recommended that an educational program be instituted to encourage people to have regular health examinations to detect disease before it became disabling and to correct unhealthful habits of living (McCann, 1981). Over the years, the idea has grown and is being embraced by industries as a means to protect its investment in managerial talent and the overall workforce (McCann, 1981).

The leading causes of death at the turn of the century were infectious diseases, such as influenza and diphtheria, but with effective treatment and preventive measures, the number of deaths with these types of diseases have steadily

decreased (McCann, 1981). What exists today are chronic diseases such as cardiovascular diseases leading to heart attack and stroke, cancer, diabetes and arthritis, and accidents (McCann, 1981). It is estimated that 46% of Americans over the age of 45 have a chronic disease (McCann, 1981).

In 1900, the number one cause of death was pneumonia and influenza with around 200 deaths per 100,000 (Berry, 1981). The number two cause of death was tuberculosis at about the same rate. Diarrhea was the number three cause of death with about 180 deaths per 100,000 (Berry, 1981).

Today, the number one killer is heart disease with about 440 deaths per 100,000 (Berry, 1981). The second cause of death today is cancer with about 180 per 100,000, and accidents is the number three cause of death (Berry, 1981). The number one cause of death in individuals aged 15-24 is accidents, followed by homicide and then suicide (Berry, 1981). Thus, rather than bacteria or viruses, we have different risk factors associated with today's causes of death. A risk factor is determined by an epidemiological study where a population group is studied over a period of time measuring certain characteristics such as height, weight, blood pressure, and habits, and then deciding what diseases those habits were associated with (Berry, 1981).

There are controllable and noncontrollable risk factors. Noncontrollable factors consist of family history, chronological age, and sex (Berry, 1981). Although

chronological age cannot be controlled, a person can be physiologically and psychologically younger than his or her chronological age (Berry, 1981). Controllable risk factors include blood pressure level, cholesterol level, cigarette smoking, sugar intake, obesity, lack of exercise, stress level, elevated uric acid level, use of oral contraceptives, and diet, specifically a high animal fat intake and/or a low fiber diet (Sciacca, 1987).

The United States Center for Disease Control analyzed the ten leading causes of death and concluded that 10% of Americans' deaths are because of inadequacies in the existing health care system, 19.8% to human biological factors, 20.11% to environmental hazards and 48.4% to individual lifestyle behaviors (Sciacca, 1987). Lifestyle factors have become increasingly implicated as the number one enemy of American workers and represent tremendous costs to industry. Thus, modifying behaviors that contribute to the development of debilitating conditions is more cost effective than treating established illnesses (Sciacca, 1987).

Modifiable behaviors include smoking, coping with stress, drug and alcohol use, nutritional habits, and lack of exercise. Cigarette smoking is the single major preventable cause of illness and premature death in the United States (Sciacca, 1987). Eighty percent of deaths from respiratory diseases, 83% of lung cancers, 25% of all cardiovascular diseases, and 30% of all cancers are directly

associated with smoking (Sciacca, 1987). Another study revealed that 50% of nonsmoking employees experienced difficulty working near a smoker; 36% reported they had to physically remove themselves from their work areas because they were bothered by cigarette smoke; and 19% of American businesses reported nonsmokers claimed illness and benefits because of on-the-job exposure to secondhand smoke (Sciacca, 1987).

Occupational stress has been of growing concern to business and industry because of its implications as a cause of productivity losses as well as diseases of the gastrointestinal system, cardiovascular disorders, migraine headaches, muscular-skeletal disorders, skin disorders, cancer, suicide, anxiety, depression, and insomnia (Sciacca, 1987). These, in turn, cause poor job performance, absenteeism, early retirement, higher work accident rates, and poor management-employee relationships (Sciacca, 1987).

Alcohol abuse accounts for 10% of all deaths in the United States due to accidents because of alcohol's adverse effects on vision and performance (Sciacca, 1987). Alcoholic employees, as compared to nonalcoholic employees, have been estimated to have a 360% higher accident rate, a 250% higher rate of absences, and 500% more compensation claims than other employees (Sciacca, 1987).

Six of the ten leading causes of deaths are linked to diet. Fat and cholesterol consumption is linked to coronary heart disease, sugar intake to diabetes, excess consumption

of sodium to hypertension, and lack of fiber to colon cancer (Sciacca, 1987). According to the American Heart Association, coronary heart disease is responsible for more than 600,000 deaths each year in the United States--50% are related to sudden cardiac death (Walker, 1987). Cancer is the second major cause of death in the U.S. causing 15% of all deaths (Walker, 1987). The American Cancer Society states that the lung, breast, uterus, and colorectal are at greatest risk for the development of malignancy (Walker, 1987). Stroke claimed more than 1.7 million victims in the United States, with 414,000 people suffering a stroke each year (Walker, 1987). Thirty-eight percent of all deaths in the United States are caused by heart disease due to risk factors such as smoking, hypertension, lack of exercise, diet, stress, family history, and diabetes (Bellingham, 1987). Lifestyle contributes to 54% of heart disease deaths, 9% is due to environment; 12% due to health care delivery, and 25% is due to heredity (Bellingham, 1987). Lifestyle contributes to 37% of cancer deaths; 24% is due to environment; 10% is due to health care delivery and 29% is due to heredity (Bellingham, 1987). Lifestyle behavior accounts for 69% of motor vehicle accidental deaths; environment accounts for 18% of vehicle deaths; health care delivery accounts for 12% and heredity accounts for 1%. Seventy percent of lifestyle habits causes death by cirrhosis of the liver; 9% is due to environment; 3% by health care delivery and 18% due to heredity (Bellingham, 1987).

Health Promotion Programs

A major advantage of health promotion programs being conducted at the workplace is the opportunity to reach a large proportion of the adult population (Sciacca, 1987). Company communication networks can be used to encourage participation and promote the program effectively. The convenience and accessibility of a worksite health promotion program eliminates additional commuting time and travel costs, and provides reinforcement and support from work-related peer groups when acquiring and maintaining new healthful behaviors (Sciacca, 1987). Potential organizational benefits include reduced absenteeism, improved morale, increased capacity to perform, improved public and employee relations, and attraction and retention of higher quality employees because of the image the organization has projected of caring about the health of their employees (Sciacca, 1987). Cost containment, reducing absenteeism, improving employee morale, and increasing productivity are important corporate rationales for worksite health promotion (Conrad, 1987). Improved morale is expected to reduce turnover, increase loyalty to the company, and improve workforce productivity (Bellingham, 1987). The morale-loyalty-absenteeism-productivity issue may be as important as health costs in the development of wellness programs (Conrad, 1987).

From the employer's point of view, worksite health programs have represented a type of employee benefit that

has been linked to benefits to the employer such as enhanced employee morale, improved productivity, and decreased health care costs. Health programs also act as a recruitment tool to obtain and keep satisfied employees on the job (Orlandi, 1986).

From the employee's point of view, worksite health programs are an efficient way to support and maintain healthful lifestyle changes and a convenient way to initiate new social interaction (Orlandi, 1986). The program provider perceives the worksite as a place to promote health and reduce the risk of chronic illnesses within a large identifiable target group (Orlandi, 1986).

Many corporations like Johnson & Johnson, Campbell Soup, Kimberly-Clark, Blue Cross-Blue Shield of Indiana, Tenneco, AT&T, IBM, Metropolitan Life, Control Data, Pepsico, and the Ford Motor Co. have developed worksite health promotion programs (Conrad, 1987). The typical program is on site, company run, modestly facilitated (e.g. shower, exercise room), during company time, available to all employees at a minimal cost to participants, year-round, and is managed by a part-time or full-time health and fitness director (Conrad, 1987).

The number of worksite health promotion programs are growing. Fielding and Breslow, (1983) reported 21.1% of surveyed companies had some type of health promotion program. Davis's study in 1984 showed that 23% had worksite health promotion programs. Reza-Forouzesh and Ratzker's

1984-1985 study showed an increase of 29%, and the Business Roundtable Task Force on Health showed that 37.6% of surveyed companies had some type of health promotion program (Conrad, 1987).

Participation In Worksite Wellness Programs

In the 50's, organization-sponsored wellness programs consisted of sports and recreation such as softball, volleyball, soccer, and bowling. Employers felt that investing a small amount in equipment cost might help boost morale (Feuer, 1985). Structured fitness programs, nutrition counseling, smoking cessation, and the whole realm of emotional well-being were beyond the scope of organization-sponsored programs thirty years ago (Feuer, 1985).

In the 70's, formalized fitness programs and corporate athletic facilities began to appear and the idea of running during the lunch hour or working out before or after work became very appealing for the growing number of health-conscious employees (Feuer, 1985). In the late 70's and early 80's, the notion of physical assessment (e.g. stress tests and life-style surveys), corporate wellness, and individualized fitness programs evolved in the employee health movement (Feuer, 1985). Because American businesses became obsessed with beating the Japanese in increasing morale and improving productivity of their employees

wellness in the workplace began in large businesses of more than 5,000 employees in order to boost morale, improve quality and productivity, and also to reduce absenteeism (Feuer, 1985).

Results of a consensus survey that appeared in the July, 1985 issue of Personnel (Levine, 1985) suggested that 71% of respondents had developed a wellness program with the following goals for investing in the program: Reduce health-care costs, increase productivity, improve performance, enhance the company's image, protect employees, boost morale, and aid in recruitment (Solomon, 1985). Ten out of fourteen companies evaluated their wellness programs, seven through employee attitude surveys, two through surveys designed by consultants, and one through employee comments and a survey designed by company employees. Eight of the ten companies said they had improved employee health, seven saw improved employee morale, three reported decreased absenteeism, three reported decreased health care costs, two noticed improved performance, one company had more success in recruiting top people, and one company reported improved productivity (Solomon, 1985). Seven of the companies who responded were consumer-goods manufacturers and seven were industrial-goods manufacturers. When asked how confident they were that their results were attributed to the wellness programs, only three said they were very or extremely confident. In fact, these three companies were the only ones that had more than 5,000

employees, while the others had less, with higher invested interest over the other companies ($60,000 and $330,000) (Solomon, 1985). Problems companies have had with their wellness programs include budget restrictions, obtaining adequate space, lack of management support, lack of participation in exercise programs, and people signing up to attend and not showing up (Solomon, 1985).

Eight companies reported not having wellness programs, but five of the eight said they were considering designing one. Some obstacles they were facing included a lack of necessary resources; an uncertainty about the returns they would get from their investment; lack of staff to design, install, and maintain a wellness program; lack of management support; and lack of time (Solomon, 1985). Since wellness programs are fairly new, more time may be needed to iron out the bugs before convincing employers, employees, and upper management that wellness activities should take a high priority (Solomon, 1985).

Wellness programs provide the information and resources for employees to reduce their risk factors and maintain healthy behaviors. Worksite wellness programs provide the long-term supportive environment and continuous provider contact necessary to sustain behavior change (Wendy Fink Assoc., 1986). Some people can make their own lifestyle changes once their awareness level has been raised about why and how change can benefit them. The major components of wellness programs should include strategies to provide

information that raises awareness and increases knowledge about health issues; motivational strategies to allow employees the opportunity to personalize their information by trying out new behaviors; learning skills and experiencing the support of others in a safe environment; and providing employees with on-going behavior change programs in order for them to proceed at their own pace by practicing and committing themselves to the new behavior long enough for it to become a habit (Wendy Fink Assoc., 1986). Such wellness programs include posters, bulletin boards, pamphlets, charts, lectures, health screenings, visual aids, contests, exercise activities, support sessions, self-help curricula, and on-going incentives that recognize new and sustained behaviors (Wendy Fink Assoc., 1986).

According to Ardell, wellness is a conscious and deliberate approach to an advanced state of physical, social, intellectual and psychological/spiritual health. Wellness is a balanced approach between self-responsibility, nutritional awareness, stress awareness and management, physical fitness, and environmental sensitivity; a positive and fun approach as it improves the quality of existence and the satisfactions of being by reducing morbidity and mortality; and a systematic approach requiring a personal wellness plan to carry them successfully through the early period of behavior change maintenance (Ardell, 1977). The wellness plan should consist of the following six elements:

1) written goal statements that are positive, measurable, and have a time period; 2) written goal supportive activity commitments that ensure action in support of each goal; 3) a listing of payoffs and barriers which clarify and strengthen motivation and identify difficulties and a means for overcoming obstacles; 4) a written contract to complete the plan, witnessed by friends, associates, and supporters; 5) a set of benchmarks to chart progress; and 6) a method or technique to evaluate and revise the wellness plan (Ardell, 1977).

Wellness is not a fad but a movement. In other words, wellness is not "a practice, interest or fashion taken up with great enthusiasm for a brief period--a craze" (dictionary meaning of "fad"), but "activities of a group toward the achievement of a goal or change in position" (dictionary meaning of "movement") (Ardell, 1977). It is extremely difficult to develop and continue a conscious commitment to wellness if a person does not receive encouragement or support of any kind at home or work or if the environmental surroundings are hostile or injurious to good health practices (Ardell, 1977).

Other phrases related to wellness, which are equally popular terms in use today, are health promotion, health education, holistic health, and medical self care. Health promotion refers to a broad variety of activities and services, including risk reduction classes, testing, health hazard assessments, fitness activities, and physical exams.

(Ardell, 1977). Health education refers to risk reduction, retraining attitudes and behaviors and education; holistic health refers to mind/body connections in health and illness, personal responsibility, and a balanced lifestyle. Medical self care teaches appropriate levels of self-sufficiency (Ardell, 1977). These five areas are highly interconnected and supportive of common objectives; all that varies is the emphasis (Ardell, 1977).

The following ten factors and trends can be noted as significant forces shaping the wellness movement: 1) breakthrough works such as the 1978 "Stay Well Plan" designed by Blue Shield of Northern California for the Mendocino School District to seek a way to control rising health insurance rates and to motivate employees to make an effort to avoid unnecessary use of medical care; 2) cost crisis such as the rate of annual increases in health care spending, the percent of GNP consumed by this sector of the economy, and the individual burden on American consumers regarding out-of-pocket and health insurance charges; 3) consumer consciousness such as caring for their own medical needs; 4) mind/body awareness; 5) horrible good things which refers to the benefits that have resulted from mistakes, deceits, and abuses of the last decade like the epidemic levels of coronary disease which brought about a search for ways to reduce one's chances of suffering premature chronic disease; 6) industry responsiveness towards health promotion programs; 7) powerful individual voices like Kenneth Cooper,

George Sheehan, William Hettler, Hans Selye, Dr. Halbert Dunn, and John Travis; 8) other movements such as holistic health, the running boom, aerobic dance classes, and natural food groups; 9) research on life expectancy and morbidity levels, the Framingham studies on risk factors of health disease, and health promotion strategies; and 10) organizations like the President's Council on Physical Fitness and Sports, the American Medical Association, American Heart Association, and the YMCA's across the nation (Ardell, 1977).

In 1982, AT&T Communications began a health promotion program entitled "Total Life Concept" (TLC) to create a work environment supportive of positive health practices with the belief that a healthy organization required healthy employees and that just urging employees to take more responsibility for their health and providing the opportunity for them to do so would not be as effective without a supportive corporate culture (Bellingham, 1987). The TLC has had a profound impact on the health care costs, attitudes of the organization, the corporate culture, and the employees. AT&T projected that if the health improvements discovered in its study were continued over the next ten years, the company could save $72 million from fewer heart attacks and $15 million from a reduction of cancer (Welter, 1988).

Early in 1979, Johnson & Johnson started its "Live For Life" program. They had two goals: to provide the means for

J&J employees to become among the healthiest in the world and to determine the degree to which "Live For Life" is cost beneficial (Walker, 1987). The "Live For Life" program is a major corporate health promotion program consisting of a health screening, a lifestyle seminar, and lifestyle improvement programs such as smoking cessation, nutritional awareness, exercise, stress management, weight control, and general health knowledge (Elias, 1986). A 2-year quasi-experimental non-equivalent control group epidemiological study was conducted to evaluate its impact on biomedical data (e.g. cholesterol levels, blood pressure, body weight), lifestyle or behavioral data (e.g. smoking, alcohol use, physical activity, nutrition), job performance, general attitudes, and health attitude measures (Elias, 1986). Statistically significant differences were observed in fitness level, weight control, smoking cessation, stress management, and reported employee attitudes at work after one year of the program (Fielding, 1984; Elias, 1986).

According to a study by Fielding in 1984, estimated employee participation rates range from 20-40% for on-site and 10-20% for off-site programs (Conrad, 1987). The biggest drawbacks to wellness programs are low employee participation and a 30% drop-out rate (Bellingham, 1987). A program in which 35% of eligible employees participate is considered successful (Bellingham, 1987).

The Carolina Healthstyle Project, a wellness program for public sector employees, studied the appeal of wellness

programs by examining the intent to participate by administering a core questionnaire annually (Kronenfeld, 1987; Conrad, 1987). According to data collected from this study and other studies by AT&T, Tenneco, Blue Cross and Blue Shield of Indiana, and Exxon, participants tended to be a self-selected healthier group based on certain personality traits like self-motivation (Conrad, 1987). Nonrespondents tended to be nonmanagement, less-educated, female (in some sites), smokers, nonexercisers, non-seat belt users, and less likely to believe in the health benefits of jogging and exercise. Respondents were likely to be more concerned about their health in general, nonsmokers, younger, and more knowledgeable about the health benefits of exercise (Conrad, 1987).

Control Data Corporation's StayWell Risk Profile

Since 1979, Control Data Corporation's, (CDC), StayWell program consisting of health risk profiling, medical screening, health education and life-change activities has been offered to CDC employees and more recently to employees of other corporations through a network of hospital distributorships (McCann, 1981; Elias, 1986). Participation is on a voluntary basis and all activities are provided at the worksite. Time off is made available for attendance at an orientation session, the risk profiling activity, and a group interpretation meeting (McCann, 1981). Those who sign up are weighed and measured and have their blood pressure

taken and blood sample drawn; they also fill out a questionnaire on their medical and family history, lifestyle, and mental outlook (McCann, 1981). The StayWell Health Risk Profile Questionnaire consists of 80 questions covering medical and family history, health behavior, and lifestyle. The information derived from each individual's assessment is compiled into aggregate data to provide a picture of the company as a whole, or at least to identify groups of employees where problems may exist. Using aggregate data for strategic planning helps protect the confidentiality of the assessment process (Bellingham, 1987). Upon completion of the questionnaire, each participant receives a sealed profile which identifies their most significant health risks; looks at the individual's risk of death over the next 10 hears, provided their health behavior remains the same, by listing the causes of death in order of probable occurrence and their contributing factors; and gives valuable information on ways to reduce their health risks (CDC, 1982). The profile compares the employee's chronological age with his or her "risk age" and shows how the risk age can be reduced if certain behaviors are changed (McCann, 1981). After completing the profile, participants are encouraged to select from a group of health awareness courses to attend and are proceeded by various follow-up and support-system programs (McCann, 1981).

At present, data are limited to self-reports of changes in health status and behavior. Participants in courses on

smoking cessation, weight control, exercise, stress management, and nutrition report statistically significant improvements compared to nonparticipants (Elias, 1986). Here are some of the results at different sites where the StayWell program is offered (Bellingham, 1987; CDC, 1986):

* In Ardeen Hills, MN, an employee, during the StayWell health screening, found out his cholesterol level was high, so he made dietary shifts to fish, chicken, and skim milk, decreased his butter and sugar intake, reduced his cholesterol level by 97 points, and lost nine pounds.
* In Dallas, TX, an employee, during screening, was advised he had high blood pressure, was advised to see his doctor, and has since lost 48 pounds and reduced his blood pressure from 156/120 to 114/82.
* In Oklahoma City, OK, a group of five women started a support group on weight control and have lost a total of 124 pounds over a six-month period. They call their group "The Missing Person" since they have lost the equivalent weight of one person.
* People with bad habits are 360% more likely to have four or more chronic problems, such as depression, back pain, hypertension, headaches, insomnia, and tension.

Summary

The review of literature defined health risk appraisals and how they are used to determine risk factors of individuals of the same age, sex, and race. It defined health risk factors and how they have changed through the years due to medical advancement and technology and revealed information about health promotion programs and why and how they have grown in worksites over the years. It also distinguished the relationship between health promotion and wellness programs, revealed the history of wellness programs, and pointed out some significant research that has been studied at different worksites which have implemented wellness programs. Lastly, it revealed information about the StayWell program, how and where it began, and results at different sites.

CHAPTER III

METHODS AND PROCEDURES

The procedures of this study are described in terms of a) the selection of subjects, b) operational procedures, c) research design, and d) statistical analysis.

Selection of Subjects

The author contacted the hospital representative from Stillwater Medical Center in Stillwater, Oklahoma, the Human Resource Development Coordinator, and the State Director of the State Department of Vocational and Technical Education in Stillwater, Oklahoma, to obtain permission for the Vo-Tech employees to participate in the health risk appraisal study on a voluntary basis. Permission and release forms were signed by 164 participants in October, 1986 and 49 participants in November, 1987. All 309 male and female employees aged 18 through 65 years were given the opportunity to sign up for the HRA through an organization wide orientation of the purpose and procedures involved in the health risk program.

Operational Procedures

The HRA program was conducted in October, 1986 and again in November, 1987 for those employees who volunteered to participate at a cost of $15 to each employee. The program included 1) the completion of a health risk profile questionnaire, 2) blood profile, blood pressure reading, and height and weight measurements, and 3) an interpretation of the health risk profile results.

An orientation was presented to the Vo-Tech employees by the hospital representative from Stillwater Medical Center in 1986 and 1987 prior to the health screening. A 30-minute introduction on the health risk appraisal program and the enrollment process was presented during the state staff meeting. After the meeting adjourned, sign-up sheets and health risk profiles were made available to any employee who wanted to participate. Announcements were made over the "PA" system, put in the weekly departmental newsletter (FYI), put on electronic mail, and posted throughout the department stating times, dates, and procedures of the health risk appraisal program. Sign-up sheets were made available to any employee who did not attend the orientation meetings, giving all Vo-Tech employees ample opportunity to participate.

Each participant was asked to fill out a health risk profile questionnaire prior to their health screening and was instructed to hand it in at the screening to the Stillwater Medical Center staff, who, in turn, took all

tests and questionnaires to be computer tallied. They were mailed to the central computer facility at Mercy Hospital in Oklahoma City, Oklahoma for batch processing. The questionnaire included items regarding participant's medical and family history, habits, lifestyle, and mental outlook. The information derived from each individual's assessment was compiled into aggregate data to assist organizations in planning programs which would best meet their identified health goals (Bellingham, 1987).

Each participant received a sealed profile approximately one month after the screening. This profile compared the employee's chronological age with his or her risk age and showed how the risk age may be reduced if certain behaviors were changed.

The screening took place in an 18' x 22' conference room at the State Department of Vo-Tech. Four stations were set up using two three-fold white screens to ensure privacy, protection, and confidentiality for each volunteer participant. At station 1, participants handed in their questionnaire and signed a release form and a permission form granting use of their data for this study. They proceeded to station 2 where their blood pressure readings were taken and recorded by qualified health professionals. At station 3, they were weighed with conventional hospital scales, and their height was measured using a height measurement scale on the weight apparatus. The last station was where the participants gave blood samples to be analyzed

for cholesterol and triglyceride readings.

The final step of the health program was the interpretation session in which hospital representatives and the author explained to the group and then to each individual results of the HRA program. The interpretation session was scheduled in November, a few days after participants received their individualized profiles.

During the time between administration of the two questionnaires, educational programs in fitness, smoking cessation, back safety, CPR, and motivation were offered on a voluntary basis. Flyers on health-related areas such as smoking, exercise, diet, nutritional value, high blood pressure, cholesterol, hypertension, stress management, fitness and exercise, cancer, heart disease, relaxation techniques, and lifting procedures and safety precautions were posted throughout major corridors of the department. Posters depicting healthy messages were posted on eight major bulletin boards throughout the department and were circulated once a month. Special events were available to any employee who wanted to be involved. Support groups were set up for fitness and weight management programs. Other self-study programs were available throughout the year to encourage change in lifestyle behavior.

Research Design

An evaluative survey approach using an established health risk appraisal questionnaire was used to determine

if any changes in lifestyle behavior occurred within one year. A simple comparison method was used to describe the results of this study.

Statistical Analysis

The aggregate health risk profile statistical package was prepared by the Stillwater Medical Center. The methodology of the aggregate data is available from the company upon request. The epidemiological data from the health program was compared by computer with a national data base of employee health statistics, and produced a personal health risk profile for each participant. Comparisons were prepared by the author by visually inspecting the data to determine similarities and differences between the results of the two tests.

CHAPTER IV

RESULTS AND DISCUSSION

The purposes of this study was to identify the employee population most likely to participate in the health risk appraisal program, to identify the major health risks and projected causes of death among public state agency employees, and to determine if employees made any health changes to improve their quality of life over a one-year period. One hundred and sixty-four employees volunteered to take the health risk appraisal in 1986 and 49 volunteered in 1987. Out of 180 female employees, 101 participated in 1986 and 28 participated in 1987. Out of 129 male employees, 63 participated in 1986 and 21 participated in 1987. There were 33 participants who took both health risk appraisals. The employees paid the total fee for the health risk appraisal program, which was $15. Therefore, the drop in volunteer participants could be related to this plus other factors such as participants resigning, retiring, seeking professional assistance, no changes made in lifestyle, or lack of interest and support. This chapter presents a statistical report of the data.

Results and Discussion

Table I identifies the demographic factors of sex and race and compares the results.

TABLE I

COMPARISON OF DEMOGRAPHIC INFORMATION

VARIABLE	1986 N=164	1987 N=49
MALE	38%	43%
FEMALE	62%	57%
BLACK	0%	2%
WHITE	98%	98%
OTHER	2%	0%

These results indicated that there were substantially more female participants than male participants in 1986 with 62% and 38%, respectively. Table I also shows that there was a substantial difference in race participation in both results, with 98% being white and only 2% being black or of other origin. The female participants outnumbered the male participants in 1987, 28 to 21, because there are more female employees than male employees at the state department. Fifty-six percent of the total female population

and 48% of the total male population of the state agency participated in the health risk appraisal program in 1986 which accounts for 53% of the total population. This suggests that the participants were representative of the majority employee population in the workplace. Upon completion of the HRA profile questionnaire in 1987, the participation rate dropped considerably in both the female and male population. This drop could be attributed to factors such as 1) some participants in 1986 were advised to seek professional medical advise and are now under physician's care, 2) lack of awareness that the appraisal took place, 3) lack of interest, 4) some participants saw no need to participate in 1987 because they had not changed any of their lifestyle behaviors to reduce their risk factors, therefore, no progress was made, 5) lack of support by their employers and peers, 6) negative attitude towards the appraisal tool and its effectiveness among employees, or 7) retired or resigned.

Table II presents the median age ranges of the participants in both observations in percentages.

TABLE II

COMPARISON OF MEDIAN AGE RANGE OF PARTICIPANTS

AGE RANGE	1986 N=164 MALE	1986 N=164 FEMALE	1987 N=49 MALE	1987 N=49 FEMALE
20-29	3%	15%	2%	10%
30-39	9%	20%	8%	20%
40-49	16%	13%	24%	20%
50-59	6%	11%	6%	4%
60-69	4%	2%	2%	2%
70+	1%	1%	0%	0%

These results indicate that males ranging from 40 to 49 years were the most represented group of participants in both results when compared to the other male age group ranges with 16% in 1986 and 24% in 1987. Females ranging from 30-39 years were the most represented group of participants during the with 20% participation when compared to the other female age group ranges. In 1987, the most represented female age groups participating included both females ranging from 30-39 and 40-49 with 20%. The age group most represented in both tests was the 40-49 age category with 30% (49 out of 164 participants) in 1986 and 45% (22 out of 49 participants) in 1987. The mean age was 41 years

in both results. Even though the sample size was smaller during the administration of the second questionnaire, there was no observable difference in the chronological ages of participants representing the total population of the agency. In fact, all results indicated a similarity in age when comparing employee participation in both groups.

Table III shows the percentage of employees from each division of the department who participated in the program in 1986 and 1987. The total number of employees in each division is specified in column 2, which the author obtained using phone listings distributed to each division periodically. It lists by division or alphabetically by name, each individual's name, division, room number, and extension number. Table III lists each division by its abbreviated name (spelled out in Appendix); explanation of each division can be obtained from the personnel office at the State Department of Vo-Tech upon request.

TABLE III

PROGRAM PARTICIPATION BASED ON DIVISION

DIVISION	# OF EMPLOYEES IN EACH DIVISION	1986 N=164	1987 N=49
ADMIN.	21	100%	19%
AG	15	73%	2%
AVTS	4	100%	0%
B&O	6	33%	0%

TABLE III---Continued

DIVISION	# OF EMPLOYEES IN EACH DIVISION	1986 N=164	1987 N=49
BAC	3	0%	0%
BITS	12	50%	42%
CLERK	1	0%	0%
CIMC	32	47%	9%
DHMKR	1	100%	100%
E.T.	7	71%	0%
EES	1	100%	100%
EQ.P.	9	11%	11%
EVAL	8	12%	12%
FIN	15	100%	33%
GRA	55	42%	7%
HLTH	5	40%	20%
HOMEC	10	70%	40%
HRD	3	100%	67%
I.ART	4	75%	25%
INFO	2	50%	100%
MAVCC	10	60%	0%
MKTED	4	25%	0%
OCR	1	0%	0%
OFC	1	0%	0%
P.I.O.	4	25%	0%
PERS	2	50%	0%
PLNG	5	40%	40%

TABLE III---Continued

DIVISION	# OF EMPLOYEES IN EACH DIVISION	1986 N=164	1987 N=49
PURCH	18	39%	6%
RESRH	5	0%	20%
S.PGM	6	83%	0%
SDCS	13	23%	0%
T&I	12	75%	42%
TIPS	4	0%	0%
VIEW	4	25%	0%
OAED	6	100%	17%

These results indicate that 29 out of 35 divisions were represented in 1986 and 21 out of 35 divisions were represented in 1987, which is 83% and 60% total departmental representation, respectively. Seven divisions had 100% representation in 1986, while only three divisions participated at 100% in 1987. The six divisions who did not participate in 1986 comprised a total of 15 employees. The 14 divisions who did not participate in 1987 comprised a total of 66 employees. This means that only 5% and 21% of the department's population were not represented in 1986 and 1987, respectively, when looking at divisional representation. The Administration division which is comprised of upper management personnel participated at 100%

in 1986 and dropped to 19% the following year, which also may account for the low participation rate in 1987's HRA program.

Table IV compares the educational level of participants in 1986 with those in 1987. These were obtained through verbal or visual responses by participants when contacted by the author.

TABLE IV

EDUCATIONAL BACKGROUND OF HRA PARTICIPANTS

EDUCATION LEVEL	1986 N=164	1987 N=49
HIGH SCHOOL	18%	18%
TWO-YEAR VOCATIONAL	3%	0%
4-YEAR COLLEGE	79%	82%

These results indicate that the majority of participants had a 4-year college education or greater in both observations.

Table V determines program participation based on job positions. This information was obtained from the personnel administrator and is broken down by category. Job positions listed under the category "Officials & Administrators" include the State Director, Assistant State Directors and Division Heads (Supervisors, State Supervisors, Coordinators

of each division). The job category "Professional" includes such positions as Assistant State Supervisors, District Supervisors, Auditors, Field Service Coordinators, and all mid-management positions. "Technicians" include illustrators, technical writers and media specialists. The "Paraprofessional" category includes editors, career information specialists, film specialists and other specialists jobs. "Office & Clerical" include secretaries and clerks. The category "Skills/Crafts" include bindery workers, platemakers, and press operators. "Service Maintenance" includes custodial and other maintenance positions. Listed in the table is the job category, number of positions available in each category, and the percentage represented by each category in both tests.

TABLE V

PROGRAM PARTICIPATION BASED ON POSITION

CATEGORY	# OF POSITIONS	1986 N=164	1987 N=49
ADMINISTRATORS	48	71%	27%
PROFESSIONAL	107	60%	20%
TECHNICIAN	13	25%	15%
PARAPROFESSIONAL	12	58%	33%
OFFICE & CLERICAL	95	56%	9%
SKILLS/CRAFTS	20	0%	0%
SERVICE MAINTENANCE	14	14%	0%

These results indicate that the highest percentage of participants in 1986 were the administrators with 71% followed by the professional staff with 60% and the paraprofessional staff with 58%. In 1987 the highest percentage of participants were the paraprofessional group with 33% followed by the administrative group with 27% and then the professional group with 20%. This indicates that participants of the health risk appraisal program are educated administrators and professionals.

Table VI compares the results of the percent of employees who are at low risk, moderate risk, and serious risk in each identified risk factor. Each risk factor has different interpretations of low risk, moderate risk, and serious risk. Therefore, an explanation of each risk factor level will be listed before the table.

Explanation of risk factor levels:

Seat Belt Use:	Low risk:	use > 75% of time
	Moderate:	use 25-74% of time
	Serious :	use < 25% of time
Exercise:	Low risk:	climb > 15 flights of stairs or walk 1.5 miles or equivalent 4 times/week
	Moderate:	climb 5-15 flights of stairs or walk 0.5 miles to 1.5 miles 4 times/week
	Serious :	less exercise than above
Weight:	Low risk:	< 10% overweight
	Moderate:	11-20% overweight
	Serious :	> 20% overweight
Smoking:	Low risk:	non-smoker
	Moderate:	< 1 pack or < 5 pipes or cigars/day
	Serious :	more than above

Drinking: Low risk: < 15 drinks a week
Moderate: 15-24 drinks a week
Serious : more than above

Cholesterol:

Age Group	Low Risk	Moderate	Serious
0-19	<170	170-185	>185
20-29	<200	200-220	>220
30-39	<220	220-240	>240
40+	<240	240-260	>260

Hypertension: Low risk:systolic <140 and Diastolic <90
Moderate:systolic 140-159/Diastolic 90-94
Serious :systolic =>160/Diastolic =>95

< means less than
> means greater than and => means equal to or greater than.

TABLE VI

COMPARISON OF THE PERCENT OF PEOPLE WHO ARE AT LOW, MODERATE, AND SERIOUS RISK FOR EACH RISK FACTOR

RISK FACTORS	1986 (N=164) LOW	MODERATE	SERIOUS	1987 (N=49) LOW	MODERATE	SERIOUS
SEAT BELT USE	35%	21%	43%	80%	8%	12%
EXERCISE	31%	41%	27%	39%	31%	31%
WEIGHT	56%	18%	26%	61%	20%	18%
SMOKING	84%	4%	10%	98%	0%	2%
DRINKING	96%	4%	1%	100%	0%	0%
CHOLESTEROL	73%	12%	16%	73%	14%	12%
HYPERTENSION	77%	18%	5%	78%	10%	12%

These results indicate that the most serious risk factor affecting the sample of state employees was the use of their seat belts (43%) in 1986 because they were in use less than 25% of the time (refer to explanation of risk levels, listed before Table VI) and the lowest risk factor was drinking less than 15 drinks a week (refer to explanation of risk levels, listed before Table VI). The most serious risk factor observed in 1987 was lack of exercise (31%) and the least serious risk factor was also drinking less than 15 drinks a week (100%).

The most substantial change when observing both results was the seat belt usage which went from most serious at 43% to least serious at 80%. In 1986 the only serious risk factor was seat belt use with 43% using their seat belts less than 25% of the time (refer to explanation of risk levels, listed before Table VI), but 35% were using them more than 75% of the time and 21% used them moderately. In 1987, 80% of the sample was using their seat belts more than 75% of the time and only 12% used them less than 25% of the time (refer to explanation of risk levels, listed before Table VI). There was a substantial difference in seat belt use when comparing the 1986 results to the 1987 results. This is due partly to the new seat belt law that the state of Oklahoma passed last year, partly due to the department-wide campaign during the year to buckle up for safety by displaying signs at all entrances and exits and posting "Buckle Up" campaign posters throughout the department, and

partly due to the defensive driving course that was offered during the year to employees.

There was not much difference in the three risk levels when looking at the amount of exercise the participants partook in. In 1986, 72% exercised four times per week (refer to explanation of risk levels, listed before Table VI) and in 1987, 70% exercised four times per week.

In 1986 56% of the participants were less than 10% overweight and 61% were less than 10% overweight in 1987. Twenty-six percent were more than 20% overweight in 1986 and 18% of the participants were more than 20% overweight in 1987.

Cholesterol levels in both tests were similar, with 73% being at low risk, 12% and 14% being at moderate risk and 16% and 12% being at high or serious risk of having a high cholesterol level.

There were no substantial differences between the amount of exercise, weight, cholesterol count, and blood pressure reading when observing participants at each risk factor level. It appeared that the employees who participated in the HRA program could be classified as "apparently healthy" in these areas since 72% exercised four times a week, 77% had a blood pressure reading of less than 140/90, and 56% were less than 10% overweight.

Smoking and drinking are the lowest risk factors in both results because 84% were nonsmokers in 1986 and 98% were nonsmokers in 1987. Ninety-six percent drank less than

15 drinks a week in 1986 while 100% drank less than 15 drinks a week in 1987. The author observed that 10% in 1986 and 2% in 1987 smoked more than one pack or five cigars a day. One person out of 164 people drank more than 24 drinks a week (an average of 3.4 drinks a day) in 1986, and not one person out of the 49 drank more than 24 drinks a week in 1987.

Hypertension was also similar in both tests with 77% and 78% having a blood pressure reading of less than 140/90 showing them at low risk of having hypertension and 23% and 22% with high blood pressure.

Table VII shows a comparison of projected causes of death in the next ten years of participants due to the results from the questionnaire.

TABLE VII

COMPARISON OF PROJECTED CAUSES OF DEATH

PROJECTED CAUSES OF DEATH	1986	1987
SUICIDE	61%	65%
MOTOR VEHICLE ACCIDENTS	59%	49%
ARTERIOSCLEROSIS	55%	63%
CANCER OF BREAST	43%	29%
HOMICIDE	26%	29%
CANCER OF LUNGS	23%	20%

TABLE VII--continued

COMPARISON OF PROJECTED CAUSES OF DEATH

PROJECTED CAUSES OF DEATH	1986	1987
CANCER OF INTESTINES/RECTUM	14%	8%
STROKE	12%	14%
CANCER OF CERVIX	4%	NA *
CIRRHOSIS OF LIVER	2%	NA *
DIABETES MELLITUS	2%	4%

* NA indicates that these diseases were not considered as leading projected causes of death in 1987.

These results indicate suicide as a projected major cause of death for the employees who participated in both programs with 61% and 65%, respectively. Factors that account for such a high ranking may include: 1) job demand and pressure, 2) stress on and off the job and the inability to cope with those stressors, 3) environmental hazards, and 4) social pressures.

In most instances, and according to Control Data's profile information (CDC, 1982), a cause of death may be shown for which a participant's risk is average, but that possible cause of death is included in the participant's list simply because in their age group, should death occur, it has a high level of probability as a cause. For example, suicide commonly shows up high on the list for young people

and should not be misinterpreted to indicate a higher than average risk. Statistics show suicide to be a major cause of death at certain ages (CDC, 1982).

Motor vehicle accidents was listed as the second leading projected cause of death for 59% of the population in 1986 and dropped in 1987 to the third leading projected cause of death for 49% of the population which could be due to the defensive driving course, seat belt law, and seat belt campaign drive.

Arteriosclerosis was the third projected cause of death listed in 1986 and the second projected cause of death listed in 1987 at 55% and 63%, respectively. Cancer of the breast may affect 71 of the 101 female employees who participated in 1986 and 14 of the 28 who participated in 1987. Homicide, lung cancer, stroke, diabetes mellitus, and intestinal cancer are all listed as major causes of death in both.

The purpose of this study was to find out if there were any differences in the representation of participants volunteering in 1986 and 1987. The author concluded that there was no substantial difference in the age groups participating in both tests; representation was similar in both tests when looking at the divisional table showing participation in each area; education level was the same in both cases; and position representation did not change substantially when comparing results to both tests.

The second question dealt with changes in health risk factors and projected causes of death. It was found that the only substantial change in health risk factors was the use of seat belts. There was no substantial change in the other risk factors listed as observed by the author.

The only substantial change in the major causes of death was that the second leading projected cause of death (motor vehicle accidents) reported in 1986 dropped to the third leading projected cause of death in 1987. The third leading projected cause of death (arteriosclerosis) in 1986 rose to the number two projected cause of death in 1987.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains a summary of the study, conclusions derived from the results, and recommendations for further research.

Summary

The purpose of this study was:

a) To identify the employee population most likely to participate in the health risk appraisal program.

The employees who participated in the HRA program were mostly female; predominately white; 41 years of age; participants from 29 of the 35 divisions in the department (the six divisions not represented only accounted for 5% of the entire population); educated with 79% possessing a a 4-year degree or more; and participants who held administrative or professional positions.

b) To identify major health risks and projected causes of death among the state agency's employees.

The major and only serious health risk in 1986 was seat belt use, but transposed in 1987 to become one of the lowest health risks.

There was no major or serious health risk factor observable in 1987 since 98% were nonsmokers, 80% used their seat belts over 75% of the time, 61% were not overweight, 100% did not drink, 73% had low cholesterol levels, and 78% had low blood pressure readings. Exercise was the only health risk factor that could be questioned as a possible health risk factor since 31% walk less than 0.5 miles four times a week.

Suicide was projected as the major cause of death among the participants. Stress can be attributed to suicide, and because the majority of participants hold upper and middle-level management and supervisory jobs, job demand and pressure can play a big role in stress-related health problems.

Motor vehicle accidents are another major projected cause of death among Vo-Tech employees. Arteriosclerosis was another major health concern which is America's number 1 killer. The other major diseases that should be of concern to the participants in this study are cancers of the breast, lung, intestines, rectum, and cervix; stroke and diabetes mellitus.

c) To determine if employee's made any substantial health changes to improve their quality of life during the one-year period.

The only substantial change the author observed was the seat belt usage when 43% of the participants wore their seat belts less than 25% of the time in 1986 and changed to 12%

in 1987. Looking at it from another perspective, 35% of the participants wore their seat belts more than 75% in 1986 while 80% wore them more than 75% in 1987.

Even though there were other activities scheduled throughout the year such as smoking cessation programs, fitness activities, weight contests, flyers posted and distributed on obesity, exercise, hypertension, cancer, stress management, nutrition, etc., and self-study materials available in exercise, nutrition, weight management, stress management, back safety, safety procedures, relaxation, and other wellness related materials and programs, there was no substantial change in lifestyle behaviors among the participants.

d) If there was any difference in the representation of participants volunteering in the 1986 or 1987 health programs.

There was a substantial difference in the sample size between the results but there was no difference in the representation of participants volunteering in the health program in age, sex, or race.

Because the average chronological age in both tests was 41 years of age; 56% of the total female population and 48% of the total male population (53% of total population) participated in 1986; 20% of the participants in 1986 also participated in 1987; 29 out of the 35 departments were represented in 1986 and there was a 60% representation in 1987; the author concludes that there was no substantial

difference in the representation of participants in both screenings.

e) If there was any change between the two groups on their health risk appraisals relating to health risks factors and causes of death.

There was no substantial difference in health risk factors or causes of death between the two results with the following exceptions:

1) There was a substantial difference in seat belt usage between the two results.

2) There was a substantial difference in the second and third leading projected causes of death between the results where motor vehicle accidents and arteriosclerosis were the second and third leading projected cause of death in 1986. These same two causes of death were the third and second projected cause of death in 1987, respectively.

Conclusions

It was concluded that the sample in this study could be categorized as "apparently healthy" when comparing their results to the epidemiological data which could mean that the study attracted the "healthy-minded" employees instead of the "at risk" employees. According to the data collected from this study, and other studies such as AT&T's "Total Life Concept", Exxon, Blue Cross & Blue Shield of Indiana and the Caroline Healthstyle Project, participants tended to be a self-selected healthier group. Therefore, this study may

have been selective in participant representation.

Health risk appraisal programs should be publicized more to increase participation and awareness within the workplace. Divisional orientation sessions could be beneficial in reaching the whole population. Health care costs, absenteeism records, and wellness program participation records should be kept and maintained in order that researchers can compare results for the success or failure (effectiveness) of implementing health programs in the workplace.

Recommendations

In reviewing the methods, procedures, and results of this study, the following recommendations are warranted:

1. There is a need for further research in the success of health risk appraisals and health promotion programs in organizational settings.

2. Gender should be specified differently in the aggregate epidemiological data batch processing whereby researchers can distinguish differences between gender results instead of as a whole group since there are major physiological differences in the sexes.

3. Aggregate data should be analyzed more closely to determine its accuracy and standards of computation.

4. Persons who participate in health risk appraisal programs should be investigated further.

5. Data collection through questionnaires, surveys, interviews and observations should be continued to evaluate the effectiveness of wellness programs at worksites.

6. Records should be kept and maintained on results, health care costs, absenteeism, attendance of workshops and follow-up sessions of each participant so the effectiveness or lack of effectiveness of wellness programs can be analyzed and studied.

7. More emphasis should be placed on educational programs, motivational programs, involvement in physical fitness activities, stress management courses, weight management programs, and communication of the benefits of better lifestyle behaviors, better health behaviors, and greater knowledge of what wellness is and how it can benefit the individual employee as well as the organization should be maintained in order to see that a positive change in lifestyle behaviors among the employees occurs.

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EXPLANATION OF DIVISION ABBREVIATIONS

ADMIN - Administration Division.

AG - Vocational Agriculture

AVTS - Area Vo-Tech Schools

B&O - Business and Office Education

BAC - BID Assistance Center

BITS - Business and Industry Training Service

CLERK - Clerk and Treasurers

CIMC - Curriculum and Instructional Materials Center

DHMKR - Displaced Homemakers and Single Parents

E.T. - Employment and Training

EES - Educational Equity Service

EQ.P. - Equipment Pool

EVAL - Evaluation and Testing

FIN - Finance

GRA - Graphics

HLTH - Health Occupations Education

HOMEC - Home Economics and Consumer Education

HRD - Human Resource Development

I.ART - Industrial Arts/Technology Education

INFO - Information Services

MAVCC - Mid-America Vocational Curriculum Consortium

MKTED - Marketing Education

OCR - Oklahoma Civil Rights Compliance

OFC - Office Supplies

P.I.O.- Public Information Office

EXPLANATION OF DIVISION ABBREVIATIONS

PERS - Personnel and Special Services

PLNG - Planning

PURCH - Purchasing and Plant Services

RESRH - Research

S.PGM - Special Programs

SDCS - Systems Design and Computer Service

T&I - Trade and Industry

TIPS - Training for Industry Programs

VIEW - Vital Information for Education and Work

OAED - Oklahoma Adult Education

[redacted] RELEASE FORM

I, the undersigned, release my [redacted] Health Risk Profile records to Sandra Lewis for use in compiling data for her Master's Thesis.

I understand the information will be kept confidential in accordance with applicable policies on data privacy and will only be used to evaluate program effectiveness.

I release Stillwater Medical Center, my place of employment, and Sandra Lewis from all liability connected with my participation in the [redacted] program.

SIGNATURE_____

DATE_____

STILLWATER MEDICAL CENTER

[redacted] Program Enrollment

Your Name _____
(last) (first) (m)

△ Employee
△ Spouse

Employee I.D. _____

Work phone _____

I am enrolling in the [redacted] Program as described in the program brochure. I understand that:

* The program is voluntary.

* The personal information which I provide will be kept confidential in accordance with applicable policies on data privacy and will be used only in aggregate form to evaluate program effectiveness and as part of an aggregate data base which may be used for marketing purposes.

* No warranties have been made to me regarding the program. I release Stillwater Medical Center and my place of employment from all liability connected with my participation in the [redacted] Program.

Signature _____ Date _____

[redacted]

[redacted]

VITA

Sandra Lewis

Candidate for the Degree of

Master of Science

Thesis: EVALUATION OF A SELECTED HEALTH RISK APPRAISAL PROGRAM

Major Field: Health, Physical Education, and Recreation

Biographical:

Personal Data: Born in Parsons, Kansas, February 25, 1954, the daughter of Vernon and Betty Lewis.

Education: Graduated from Sooner High School, Bartlesville, Oklahoma, in May, 1972; received 2-year Associates Degree in Business at Oklahoma State University, Stillwater, OK, May, 1974; received Bachelor of Science Degree in Business Administration with an emphasis in Personnel Management at Oklahoma State University, Stillwater, OK, May, 1981; completed requirements for Master of Science Degree in Health, Physical Education and Leisure Sciences with an emphasis in Applied Health Science at Oklahoma State University, Stillwater, OK, July, 1988.

Professional Experience: Film Specialist and Manager at the Oklahoma State Department of Vo-Tech, 1974-1985; Graduate Assistant/Building Supervisor at the OSU Colvin Center, 1985-1986; Graduate Assistant/Wellness Facilitator for the Oklahoma State Department of Vo-Tech, 1986-1988.

Presentations: Conducted Inservice training programs at the State Department of Vo-Tech on topics such as Back Safety, Fitness, Stress Management, Motivation and Choices, 1986-1988.

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