

A COMPARISON BETWEEN SCHOOL DISTRICT EMPLOYEES WITH AND
WITHOUT CHRONIC HEALTH CONDITIONS FOR THEIR HEALTH BEHAVIOR
STAGES OF CHANGE

A THESIS
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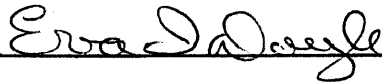
To the Dean of Graduate Studies and Research:

I am submitting herewith a thesis written by Janie Lynn Crosmer entitled "A Comparison of School District Employees With and Without Chronic Health Conditions For Their Health Behavior Stages of Change." I have examined this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science with a major in Health Studies.



Dr. Robin C. Rager, Major Professor

We have read this thesis
and recommend its acceptance:





Department Chair

Accepted: 

Dean of Graduate Studies and Research

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DEDICATION

To my parents, for giving me love, patience and support. Thank you for always believing in me when I was unsure of myself and instilling in me a drive to succeed.

ACKNOWLEDGEMENTS

I would like to thank my best friend and life partner, Scott, for supporting me through this endeavor with his patience, love, and encouragement. Thanks for always believing in me.

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ABSTRACT

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The purpose of this study was to compare the differences between school district employees with and without chronic health conditions (diagnosis of hypertension, hypercholesterolemia, and overweight) for their health behavior stages of change for exercise, diet, weight loss, and tobacco use. Research data were collected using a survey questionnaire developed for a worksite wellness program evaluation project funded by the Texas Department of Health. Of the 512 employees who received the survey questionnaire, 255 respondents completed and returned the questionnaires, for a 49.8% response rate. Descriptive statistics and chi-square tests were performed to determine if significant differences in stages of change for risk factors existed for those with and without chronic health conditions. From the chi-square analyses, statistically significant differences were found for: high-fat food consumption stages of change and weight and/or body fat stages of change between overweight and non-overweight respondents, and weight and/or body fat stages of change between respondents with and without hypertension.

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CHAPTER I

INTRODUCTION

Time after time, the keys to a healthy lifestyle have been identified: regular exercise, reducing fat intake to less than 30% of total calories, not smoking, eating more fruits and vegetables, and losing or maintaining weight. Many Americans, however, do not follow these healthful practices, and recent trends actually indicate an increase in caloric intake, greater use of high-fat convenience foods, and a decline in physical activity (American Cancer Society, 1999). According to the U.S. Centers for Disease Control and Prevention (1999), over half of the two million deaths that occur each year in the United States are due to personal health behaviors. These personal health behaviors are the choices people make every day that affect their health (Costakis, Dunnagan, & Haynes, 1999).

While personal health behaviors are important to everyone, they are even more vital for those with chronic health conditions, such as heart disease, hypertension, hypercholesterolemia, and obesity, all of which are factors of cardiovascular disease. These behaviors can dramatically reduce the risk of dying prematurely (U.S. Centers for Disease Control and Prevention, 1999). Cardiovascular disease alone is our nation's leading killer. About 960,000 Americans die of cardiovascular disease each year, accounting for 40% of all deaths. Consequently, eliminating cardiovascular disease would increase life

expectancy for Americans by almost 10 years (U.S. Centers for Disease Control and Prevention, 2000).

While researchers have used numerous theoretical models to address behavior change, the Transtheoretical Model, developed by Prochaska and DiClemente (1983), has been found to be one of the most useful models in determining how people change health behaviors (Costakis et al., 1999). This model has been used extensively in relation to addictive behaviors, breast cancer screening, psychological distress, and the adoption and maintenance of exercise (Booth, Macaskill, Owen, Oldenburg, Marcus, & Bauman, 1993). The application of the Transtheoretical Model is particularly important to exercise because the model accommodates actual exercise habits as well as intentions regarding future exercise behavior (Booth et al., 1993).

The Transtheoretical Model has been utilized to understand the stages through which individuals progress and the experimental and behavioral processes they use while changing behavior (Marcus, Banspach, Lefebvre, Rossi, Carleton, & Abrams, 1992). This model construes change as a process involving progress through a series of six stages: precontemplation, contemplation, preparation, action, maintenance, and termination.

Because there is the possibility of relapse back to an earlier stage, changes tend to be cyclic rather than linear (Marcus, Banspach, et al., 1992). Some changes are more stable than others, and the rate of individual change differs because some individuals move more rapidly while others remain stable

for longer periods of time (Herrick, Stone, & Mettler, 1997). Individuals may be cyclical as they make several attempts at behavior change before their goals are achieved (Marcus, Banspach, et al., 1992). Successful change depends on engaging the right process at the right stage (Peterson & Aldana, 1999). Some forms of intervention may also be more successful at specific stages (Herrick et al., 1997). An assumption of the model is that individuals use different change processes in different change stages and might benefit most from stage-tailored interventions to move them from early stages to action and maintenance (Brug, Glanz, & Kok, 1997).

Purpose of the Study

The purpose of this study was to compare the differences between individuals with and without chronic health conditions (diagnosis of hypertension, hypercholesterolemia, and overweight) for their health behavior stages of change for exercise, diet, weight loss, and tobacco use. The sample used for the study was employees of a west Texas independent school district.

Research Questions

For this study, the following research questions were addressed:

1. Is there a difference between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for fruit and vegetable consumption?

2. Is there a difference between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for fruit and vegetable consumption?
3. Is there a difference between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for fruit and vegetable consumption?
4. Is there a difference between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for high-fat food consumption?
5. Is there a difference between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for high-fat food consumption?
6. Is there a difference between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for high-fat food consumption?
7. Is there a difference between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for weight/body fat?
8. Is there a difference between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for weight/body fat?

9. Is there a difference between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for weight/body fat?
10. Is there a difference between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for exercise?
11. Is there a difference between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for exercise?
12. Is there a difference between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for exercise?
13. Is there a difference between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for tobacco use?
14. Is there a difference between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for tobacco use?
15. Is there a difference between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for tobacco use?

Definition of Terms

The following terms have been defined for this study:

1. Action. The fourth stage of the Transtheoretical Model, in which an individual is actively involved in a behavior change for less than six months (Herrick et al., 1997).
2. Cardiovascular disease. A variety of diseases and conditions affecting the heart and blood vessels, principally high blood pressure, heart disease, and stroke (U.S. Centers for Disease Control and Prevention, 2000).
3. Contemplation. The second stage of the Transtheoretical Model, in which an individual is intending to change a behavior within the next six months (Herrick et al., 1997).
4. Exercise. Physical activity, such as stretching, walking, jogging, running, cycling or swimming, ranging in intensity from 50% to 90% of target heart rate (Nieman, 1990).
5. Heart disease. A disease of the heart and blood vessels (Fahey, Insel, & Roth, 1997).
6. High-fat food. A food containing 30% or more of the calories from fat (Hales, 1989).
7. Hypercholesterolemia. A total blood cholesterol level, including low-density lipids (LDL) and high-density lipids (HDL), of 200 mg/dl and above (Fahey et al., 1997).

8. Hypertension. A blood pressure reading ranging from 140/90 and above (Hales, 1989).
9. Maintenance. The fifth stage of the Transtheoretical Model, in which an individual has sustained a behavior change for at least six months (Herrick et al., 1997).
10. Obesity. A medical condition characterized by an excess of body fat, not necessarily by excess body weight.
11. Overweight. A body weight of at least 20 pounds over the recommended ranges according to a height/weight table based on population norms and adjusted for gender, height, frame size, and age (Fahey et al., 1997).
12. Precontemplation. The first stage of the Transtheoretical Model, in which an individual has no intention to change behavior in the next six months (Herrick et al., 1997).
13. Preparation. The third stage of the Transtheoretical Model, in which an individual is intending to take action in the immediate future, usually measured as the next 30 days (Prochaska & Velicer, 1997).
14. Termination. The sixth and final stage of the Transtheoretical Model in which an individual has no temptation to return to an old unhealthy habit and complete self-efficacy (Prochaska & Velicer, 1997).
15. Transtheoretical Model. A model by James Prochaska and Carlo DiClemente that construes change as a process involving progress through a series of six stages (Prochaska & DiClemente, 1983).

Limitations

For this study, the research limitations were as follows:

1. The study population was limited to one independent school district in west Texas.
2. The sample was limited to those who voluntarily participated in the survey questionnaire.
3. Due to the small sample size, the findings of this study may not be representative of all independent school districts.

Assumptions

For this study, the research assumptions were as follows:

1. The subjects responded honestly to survey questions.
2. Changes in diet, weight, exercise, and tobacco use could be accurately and validly measured.
3. The subjects were able to read and understand the survey questions.

Justification

With the increase in chronic diseases, such as heart disease and the diseases that contribute to its mortality rates, hypertension, hypercholesterolemia, and overweight caused by personal health lifestyle behaviors, there is an increasing need for lifestyle changes within all populations. Even though effective stage-based interventions have been extensively tested to support behavior

change, the need for health promotion professionals and clinicians to evaluate behavior changes across all populations in order to design effective and appropriate health promotion programs still remains (Boyle, O'Connor, Pronk, & Tan, 1998).

The workplace provides an excellent opportunity for health promotion programs and risk factor reduction programs. Workplace-based programs offer easy and continuous access to a large number of employees and the social support system that exists among co-workers provides an important source of aid and reinforcement towards maintaining and improving health. Successful risk factor control programs at the workplace can reduce the risk of premature disability and death, and decrease medical and disability costs (LaRosa & Haines, 1986).

CHAPTER II

REVIEW OF THE LITERATURE

Chronic diseases such as heart disease, cancer, and stroke have replaced infectious diseases as the main causes of mortality among Americans and now account for 6 out of the top 10 causes of death (U.S. Centers for Disease Control and Prevention, 1999). According to the U.S. Centers for Disease Control and Prevention (CDC), over half of the two million deaths in the United States each year are due to personal health behaviors – choices that Americans make every day that affect their health (Costakis et al., 1999). For instance, poor nutrition and lack of physical exercise are associated with 300,000 deaths in the United States each year, making these factors second only to tobacco use as a cause of death (U.S. Centers for Disease Control and Prevention, 1999). Fortunately, the majority of chronic diseases caused by lifestyle factors are preventable (Emmons, Linnan, Shadel, Marcus, & Abrams, 1999).

This review of literature discusses heart disease and three chronic health conditions (hypertension, hypercholesterolemia, and overweight) that contribute to its mortality rates. This chapter also reviews the risk factors that contribute to chronic health conditions (diet, weight, exercise, and tobacco use).

Heart Disease

Every year since 1900, excluding 1918, heart disease has been the number one killer in the United States contributing to over 900,000 deaths per year (American Heart Association, 1999). Over 20 million Americans currently are diagnosed with heart disease, five million of whom are limited in activities.

Heart disease rates in the U.S. are higher than 20 other countries.

Coincidentally, average life expectancy in these other countries also exceeds that of the U.S. By eliminating heart disease, five or more years could be added to Americans' life expectancy (Sondik, 1999). The risk factors that affect death rates for heart disease, all of which are preventable, include hypercholesterolemia, hypertension, smoking, being overweight, and lack of exercise (Sondik, 1999).

The economic burden of cardiovascular disease has a profound impact on the U.S. health care system, and this burden continues to grow as the population ages. In 2000, the cost of cardiovascular diseases in the U.S. is estimated at \$326.6 billion (American Heart Association, 1999). This includes the cost of physicians and other professionals, hospital and nursing home services, medications, home health and other medical durables, and lost productivity from both morbidity and mortality. By focusing on individuals' unhealthy life-style practices (diet, exercise, weight loss, and tobacco use) cardiac risk factors, such as hypertension and hypercholesterolemia, can be reduced (Gebhardt & Crump, 1990).

Hypertension

As many as 50 million Americans aged six and older have hypertension (i.e., high blood pressure) which is approximately one in five Americans (and one in four adults). Of those people with hypertension, 31.6% do not know they have it, 14.8% are not on special diet or drug therapy, and 26.2% are on inadequate therapy (American Heart Association, 2000). From 1987 to 1997, the death rate from high blood pressure increased 13.1%. In 1997, the death rates per 100,000 population were 14.0 for white males, 50.2 for black males, 12.8 for white females, and 40.6 for black females (American Heart Association, 2000).

Hypertension is often called the “silent killer” because it has no symptoms or warning signs. Hypertension occurs when there is resistance to normal blood flow through the arteries or increased blood output from the heart. The higher the blood pressure, the harder the heart has to work to push the blood forward. Over time, a strained heart weakens and tends to enlarge, thus increasing the likelihood of strokes, heart attacks, kidney failure, and atherosclerosis. Increased blood pressure also scars and hardens arteries, making them less elastic (Fahey et al., 1997). When combined with obesity, smoking, too much salt intake, stress, high cholesterol levels, or diabetes, hypertension increases the risks of cardiovascular problems (Hales, 1989). Diet, weight control, stress management, exercise, and medication are all means of controlling hypertension (Fahey et al., 1997).

Hypercholesterolemia

Hypercholesterolemia (i.e., high blood cholesterol) is a major risk factor for heart disease. When there is too much cholesterol in the blood, the excess builds up on the artery walls that carry blood to the heart. This buildup is called atherosclerosis, or hardening of the arteries. The build up narrows the arteries and slows down or blocks blood flow to the heart; this in turn may cause chest pain, a heart attack, or even death. Hypercholesterolemia is the most common cause of heart disease, and unfortunately, it happens so slowly that most people are not even aware of it (National Heart, Lung & Blood Institute, 1996). As cholesterol levels rise above 200 mg/dl, coronary heart disease climbs. However, for every 1% a person lowers his/her cholesterol, the risk of dying from a heart attack decreases by 2% (Bennett, Goldfinger, & Johnson, 1987; Garrison & Somer, 1985).

Cholesterol is a fatty, wax-like substance that circulates through the bloodstream and can be found in all parts of the body. It is an important component of cell membranes, sex hormones, vitamin D, and the protective sheaths around the nerves (Fahey et al., 1997). Cholesterol comes from two sources: animal foods and also the liver, which manufactures it. Because cholesterol is made in the liver, it is not an essential dietary requirement. When too much animal food is consumed, the blood retains more cholesterol than the body can use or dispose of, and then the excess is deposited on the artery walls.

Because cholesterol and other fats can not dissolve in the blood, they must be transported to and from the cells by special carriers called lipoproteins. The two lipoproteins of most importance to the body are low-density lipoproteins (LDL) and high-density lipoproteins (HDL). LDL is the major cholesterol carrier in the blood and is known as the “bad” cholesterol because it shuttles cholesterol from the liver to the organs and tissues that require it. If LDL transports more cholesterol than the body can use, the excess is deposited in the blood vessels. HDL cholesterol, however, is known as the “good” cholesterol because it works as a vacuum and carries cholesterol away from the arteries back to the liver for processing and removal from the body.

Laboratory blood tests measure total blood cholesterol. Blood cholesterol levels under 200 mg/dl are desirable, levels of 200-239 mg/dl are considered to be “borderline high,” and levels of 240 mg/dl or greater are considered to be “high.” A person with a level of 240 mg/dl or more has more than twice the risk of heart disease than a person with a level of 200 mg/dl or less. Approximately one in five American adults has a high blood cholesterol level of 240 mg/dl or greater (National Heart, Lung & Blood Institute, 1996).

Factors that affect blood cholesterol include: foods high in saturated fat, being overweight, exercise, certain diseases, some medicines, heredity, age, and gender. Foods high in saturated fat increase LDL blood cholesterol levels. Being overweight increases LDL levels and decreases HDL levels. Exercise increases HDL levels and lowers LDL levels. Certain diseases such as hyperthyroidism,

diabetes, and some liver and kidney diseases affect cholesterol in a negative way by elevating LDL's. Some medicines, such as those for hypertension (including diuretics or water pills), raise LDL levels and lower HDL levels. Beta-blockers, steroids, and progesterones, especially those that do not contain estrogen, also reduce HDL levels (Bennett et al., 1987). Genes can influence cholesterol to some extent. Blood cholesterol levels in men and women begin to increase around age 20. Pre-menopausal women have cholesterol levels lower than men; however, post menopausal women's LDL levels increase, thereby increasing the risk for heart disease (National Heart, Lung and Blood Institute, 1996).

Overweight

Overweight is characterized by a body weight above the recommended range according to a height-weight table based on population norms and adjusted for gender, height, frame size, and age (Fahey et al., 1997). More Americans are overweight today than at any time in U.S. history. According to the U.S. Centers for Disease Control and Prevention (1999), over 60 million Americans, approximately one-third of the population, are overweight. Whereas weight usually creeps up after age 30, weight problems are starting at earlier ages. While dietary factors, such as overeating, eating style, and weight cycling can lead to being overweight, other factors may also contribute: genetics, lifestyle, culture, psychology, and even economic status (Fitness & Andes, 1999). Whereas genes influence body size, shape, body fat distribution, and metabolic rates, lifestyle may determine whether a person becomes obese.

Obesity is a medical condition characterized by an excess of body fat, not necessarily by excess body weight. Obesity is defined as the accumulation of body fat that is more than 25% of total body weight for men and 32% of total body weight for women (Fahey et al., 1997). A person such as a football player or weightlifter may be overweight according to height/weight charts, but might not be obese. In 1994, the age-adjusted prevalence of obesity in the U. S. population (measured as being a body mass index (BMI) of 25 or higher) was 54.9% (U. S. Department of Health and Human Services, 1998). Body mass index (BMI) is a commonly used measure of body composition derived from body weight and height measurements.

There has been an increase in obesity for both men and women, and both adults and adolescents, across all racial backgrounds (Sondik, 1999). Obese people have an overall mortality rate almost twice that of nonobese people (Fahey et al., 1997). Furthermore, a National Institutes of Health (NIH) panel found that obese people have three times the normal incidence of high blood pressure and diabetes, an increased risk of heart disease, a shorter life span, and an elevated risk of developing respiratory problems, arthritis, and some types of cancer, compared to those who are within the recommended BMI (Hales, 1989). In addition, fat adults are more susceptible to gout, blood clots, varicose veins, hemorrhoids, intestinal disorders, and gall bladder and liver disease (Hales, 1989).

Obesity tends to be primarily a result of a sedentary lifestyle. Physical activity prevents obesity by increasing caloric expenditure, decreasing food intake, and increasing metabolic rate (Hales, 1989). In affluent countries, obesity tends to run in lower socioeconomic classes, and people in the upper class tend to be leaner. Education may be a factor; another is that a healthy, non-fattening diet that includes fresh fruits and vegetables is more expensive (Hales, 1989). Stress may also contribute to obesity. Stress releases hormones that may actually impair normal appetite regulation (Hales, 1989).

Diet

Five of the 10 leading causes of death for Americans - heart disease, some cancers, stroke, diabetes, and atherosclerosis - relate to dietary factors (Glanz, 1999). Guidelines for healthy eating developed by government, health, and scientific organizations include reducing fat and cholesterol in the diet, maintaining optimal weight, increasing complex carbohydrates and fiber, and moderating alcohol intake. Strategies for meeting these guidelines include eating more fruits and vegetables and less red meat and consuming fewer full-fat dairy products (Glanz, 1999). The National Cancer Institute has recommended that Americans decrease their fat consumption to 30% or less of total calories, increase fiber consumption to 20 g to 30 g per day, and increase fruit and vegetable intake to five servings a day (Patterson, Kristal, & White, 1996). Unfortunately, surveys suggest that fewer than one third of U.S. adults meet the minimum recommended five fruit and vegetable servings a day (Campbell,

Demark-Wahnefried, Symons, Kalsbeek, Dodds, Cowan, Jackson, Motsinger, Hoben, Lashley, Demissie, & McClelland, 1999). Numerous studies indicate a relationship between increased consumption of fruits and vegetables and lowered risk of certain cancers. In addition, high fruit and vegetable intake is associated with a lower risk of cardiovascular disease and stroke. The protective effect from fruits and vegetables may be attributed to fiber, antioxidants, and other anticarcinogenic compounds (Campbell et al., 1999).

Exercise

In terms of exercise, more than 60% of American adults are not regularly active, and 25% of the American adult population is not active at all (U.S. Centers for Disease Control and Prevention, 1999). Across all populations, 50% of individuals who join an exercise program drop out during the first three to six months (Marcus, Selby, Niaura, & Rossi, 1992). Exercise improves the overall quality of life for all participants. Moderate exercise performed on most days of the week can substantially reduce the risk of dying from heart disease, colon cancer, diabetes, and high blood pressure (U.S. Centers for Disease Control and Prevention, 1999). Exercise also reduces the risk of osteoporosis, obesity, depression, stress, and anxiety.

According to a Harvard study, an hour of exercise may add almost two hours to a person's life (Hales, 1989). Exercise helps the body become more efficient and better able to cope with physical challenges. Exercise improves cardiovascular functioning, improves metabolism, helps protect cells from

chemical damage by free radicals, improves immune function, protects against some cancers, improves physiological and emotional well being, controls blood fat levels, and controls body fat (Fahey et al., 1997). Barriers to exercise include lack of time, lack of social support, inclement weather, disruptions in daily routines, lack of facility access, and dislike of vigorous physical activity (Dunn, Marcus, Kampert, Garcia, Kohl, & Blair, 1999). A minimum of 30 minutes of low to moderate exercise, three to six times a week, can substantially lower the risk of cardiovascular disease. This includes walking, gardening, yard work, housework, and dancing.

Tobacco Use

Smoking has been recognized as one of the most critical behavioral health risk factors and one of the nation's leading health problems (O'Donnell & Harris, 1994). It is the most important preventable cause of premature death in the United States (American Heart Association, 2000), and contributes to more deaths in the United States than any other single behavior (Sondik, 1999). Despite the health warnings and risks, approximately 25% of Americans or 47 million Americans continue to smoke, and over 400,000 preventable deaths per year are attributable to smoking (Prochaska & Velicer, 1997; Sondik, 1999). Tobacco use is associated with six of the top 10 causes of death in the United States (Fahey et al., 1997). Studies have shown that both males and females who smoke are at greater risk for sudden heart attacks than nonsmokers (O'Donnell & Harris, 1994).

Smoking has negative effects on nearly every part of the body and increases the risk of many dangerous diseases. In the short term, smoking interferes with the functions of the respiratory stems and can lead to shortness of breath and conditions known as smoker's cough, smoker's throat, and smoker's bronchitis. Smoking can also cause loss of appetite, diarrhea, fatigue, hoarseness, weight loss, stomach pains, insomnia, and impaired night vision. Long-term effects of smoking include the risk of coronary heart disease, atherosclerosis, heart attacks, strokes, hypertension, hypercholesterolemia, emphysema, chronic bronchitis, and cancers of the lung, trachea, larynx, esophagus, liver, colon, rectum, pancreas, kidneys, bladder, and cervix. Smoking may also cause tooth decay, gum disease, periodontal disease, osteoporosis, diabetes, and peptic and duodenal ulcers (Fahey et al., 1997).

Cigarette smoking costs may come to \$95 billion a year, according to the Office of Technology Assessment (Hales, 1989). Businesses pay more than \$13 billion a year for smoking-related absenteeism, insurance premiums, disability payments, and training costs to replace employees who die prematurely from smoking. In 1993, it was estimated that the direct medical costs associated with smoking totaled \$50 billion. This figure was most likely conservative because the medical costs attributable to burn care from smoking-related fires, perinatal care for low birthweight infants of mothers who smoke, and treatment of disease caused by secondhand smoke exposure were not included in this calculation (U.S. Centers for Disease Control and Prevention, 1994).

Individuals who use other forms of tobacco, such as chewing tobacco and snuff also face health hazards. Both chewing tobacco and snuff lead to nicotine addiction and users are at an increased risk for cancers of the lip, mouth, larynx, and esophagus; tooth decay; inflammation and recession of the gums; high blood pressure; and high blood cholesterol levels (Fahey et al., 1997).

● The Transtheoretical Model

The Transtheoretical Model has been useful in examining how people change a variety of health behaviors (Costakis et al., 1999). According to Prochaska, Norcross, and DiClemente (1994), moving toward a specific behavior change involves predictable, well-defined stages, taking place in a period of time and entailing a series of tasks that need to be completed before an individual progresses to the next stage. Each stage does not automatically lead to the next – it is possible to become stuck at one stage or another. Individuals progress through the six stages of change - precontemplation, contemplation, preparation, action, and maintenance - at varying rates. Individuals may leave and re-enter the stages at varying points (Marcus, Simkin, Rossi, & Pinto, 1996). Effective stage-based interventions to support behavior change have been extensively tested and are found to be quite effective (Boyle et al., 1998). According to a study involving HMO members in Minnesota, members with chronic health conditions had greater readiness to change behavioral factors for physical activity, diet, and smoking, even after controlling for demographics, such as age,

gender, education, and professional advice to change behavior (Boyle et al., 1998).

As this review of literature has shown, the major killer in the United States is heart disease, which is related to chronic health conditions such as hypertension, hypercholesterolemia, and overweight. Chronic diseases are often painful, disabling, progressive, and emotionally destructive. They can limit both work and recreational activities and can reduce a person's quality of life. The financial burdens for individuals, their families, and their employers can be catastrophic. Lifestyle medications may be the only way to eliminate these chronic health conditions. By using the Transtheoretical model, health promotion specialists may be better able to understand how people change health behaviors, thus potentially increasing a person's life span and improving his or her quality of life.

CHAPTER III

METHODOLOGY

This chapter describes the methodology used in this study, including a discussion of the sample and the population setting, protection of human subjects, instrumentation, data collection procedures, and treatment of the data.

The Sample and the Population Setting

The sample used for this study was all full-time regular employees (N=512) working for an independent school district in west Texas. These employees included professionals, paraprofessionals, cafeteria personnel, administration personnel, transportation workers, clerical, custodial or maintenance, and all others. Of the 512 employees working for the school district, a non-randomized convenience sample was used. A total of 255 employees (49.8%) voluntarily participated in the survey by returning completed questionnaires. The school district's population was 75% Caucasian, 21.5% Hispanic, 3% African American, and less than 1% for all others. The age range of the population was 18-25 (3%), 25-44 (37%), 44-60 (53%), and 60+ (8%).

Protection of Human Subjects

The data used in this study had been collected for a multi-site worksite health promotion evaluation project funded by a grant from the Texas Department of Health (TDH). Therefore, permission for the use of human subjects in this study had been previously requested and received by the director of the project from Texas Woman's University Human Subjects Review Committee, and was extended to the thesis project researcher (See Appendix A). To protect the subjects' anonymity and confidentiality, no names or other unique identifiers were collected in the survey questionnaire. On the survey questionnaire, the participants were notified that participation in the survey was voluntary, and that by completing the questionnaire they were voluntarily consenting to participate in the study (See Appendix B).

Instrumentation

The instrument used for the data collection in this study was a self-report survey questionnaire developed by the project director of the Texas Department of Health (TDH) evaluation project described above (See Appendix B). The project director had experience and expertise in worksite health promotion and in the development of survey instruments for evaluation of worksite health promotion programs. The 111-item survey included items about demographics (age, gender, race/ethnicity, job type); personal and family history of chronic disease or disease-related conditions (cancer, diabetes, heart disease,

hypertension, hypercholesterolemia, overweight); health risk behaviors related to diet, exercise, weight, and tobacco use; stages of change (precontemplation, contemplation, preparation, action/maintenance) related to those health risk behaviors; health/fitness program interests; participation in worksite health promotion programs; and an open-ended question soliciting other comments.

In this study, the items from the survey questionnaire that were used were: a) demographics; b) personal history of hypertension, hypercholesterolemia, or overweight; and c) stages of change for diet (fruit and vegetable consumption, high-fat food consumption), exercise, weight/body-fat control, and tobacco use. The content of the instrument was validated by two worksite health promotion program experts at TDH and by three directors of school-based worksite health promotion programs. The experts reviewed the survey and provided feedback and revision recommendations to the TDH project director. Based on these recommendations, some minor revisions to the instrument were made.

Data Collection Procedures

During the second week of September 1999, the survey questionnaire was distributed by the school district's faculty/staff wellness program coordinator via interoffice mail to the 512 full-time regular employees of the school district. A total of 255 questionnaires were returned to the wellness program coordinator via interoffice mail, for a 49.8% return rate. Once the project director received the

questionnaires, the data was entered into a data file for statistical analysis. The questionnaires were then destroyed.

Treatment of the Data

For this thesis study, using the data collected for the TDH program evaluation project described above, descriptive statistics and chi-square tests were performed to examine the differences among the respondents related to the three chronic health conditions (hypertension, hypercholesterolemia, and overweight) and the health behavior stages of change for the five risk factors (fruit and vegetable consumption, high-fat food consumption, exercise, weight and/or body fat, and tobacco use).

CHAPTER IV

FINDINGS

The findings from the analysis of the data collected for this study are provided in this chapter. These findings are presented under the following sections: (a) demographics of the subjects, (b) chronic health conditions, (c) risk factors, (d) chronic health conditions and risk factor stages of change, and (e) summary.

Demographics of the Subjects

Survey questionnaires for this study were distributed to the 512 regular full-time employees of a west Texas independent school district. A total of 255 questionnaires were returned, for a 49.8% return rate.

Table 1 presents the demographic characteristics of the subjects. Of the employees who voluntarily participated in this study by returning their questionnaires, 83.1% were females and 16.9% were males. The average age of the respondents was 44.7. When categorized by age range, 3.9% of the respondents were 20-25 years of age, 42.8% were ages 26-45, 43.5% were ages 46-60, and 4.3% were ages 61-70. Fourteen of the respondents did not disclose their age. By job type, the respondents included professionals (57.6%),

Table 1

Demographic Characteristics of Study Respondents ($n=255$)

Demographics	n	% of Total
<u>Gender</u>		
Females	212	83.1
Males	43	16.9
<u>Age Group</u>		
20-25	10	3.9
26-45	109	42.8
46-60	111	43.5
61-70	11	4.3
Not indicated	14	5.5
<u>Job Type</u>		
Professional	147	57.6
Paraprofessional	42	16.5
Cafeteria	16	6.3
Administration	14	5.5
Transportation	13	5.1
Clerical	10	3.9
Custodial/Maintenance	6	2.4
Other	7	2.7
<u>Race/Ethnicity</u>		
Caucasian	202	79.2
Hispanic	46	18.0
African American	4	1.6
American Indian	1	.4
Asian	1	.4
Other	1	.4

paraprofessionals (16.5%), cafeteria personnel (6.3%), administrative personnel (5.5%), clerical personnel (3.9%), custodial or maintenance workers (2.4%), and all others (2.7%). The majority of the respondents were Caucasian (79.2%), and 18% were Hispanic, 1.5% were African American, .04% were American Indian, .04% were Asian, and .04% were all other.

Chronic Health Conditions

The participant responses for the three chronic health conditions examined for this study (hypertension, hypercholesterolemia, and overweight) are presented in Table 2. Of the 255 respondents, 22.7% indicated that they had been diagnosed by a physician as having hypertension, 23.9% had been diagnosed as having hypercholesterolemia, and 35.7% had been diagnosed as being overweight.

Risk Factors

The participant responses for the five risk factors examined for this study (fruit/vegetable consumption, high-fat food consumption, exercise, overweight, and tobacco use) are presented in Table 3. Of the 255 respondents, 61.8% were not eating five servings of fruits and vegetables a day, 43.1% consumed too many high-fat foods daily, 27.5% did not exercise at least 30 minutes per day most days of the week, 35.7% were overweight, and 8.2% used tobacco products.

Table 2

Respondents Diagnosed with Hypertension, Hypercholesterolemia, or As
Overweight

Diagnosis	<u>n</u>	Percent
Hypertension	58	22.7
Hypercholesterolemia	61	23.9
Overweight	91	35.7

Table 3

Respondents with Risk Factors

Risk Factor	<u>n</u>	Percent
Fruit/Vegetable Consumption	157	61.8
High-Fat Food Consumption	110	43.1
Exercise	70	27.5
Overweight	91	35.7
Tobacco Use	21	8.2

Chronic Health Conditions and Risk Factor Stages of Change

Respondents' stages of change for each of the five risk factors (fruit and vegetable consumption, high-fat food consumption, exercise, overweight, and tobacco use) were examined to determine if those who were diagnosed with one of the three chronic conditions (hypertension, hypercholesterolemia, or overweight) would be more likely to be in more advanced stages of change (SOC) than those without the chronic condition. The results of the chi-square analyses for these comparisons are presented below.

Fruit/Vegetable Consumption Stages of Change

For the fruit/vegetable consumption risk factor stages of change, for the total sample group, the greatest percentage of respondents were in the preparation stage (33.9%), which indicated that they intended to eat more fruits and vegetables within the next 30 days (Table 4).

Little difference was found between respondents with and without hypertension. Both groups were nearly the same across all stages and the greatest percentage of the respondents in both groups were in the preparation stage (38.6% of hypertensives and 32.5% of non-hypertensives). Overall, the differences between those with and without hypertension for fruit/vegetable stages of change were not found to be statistically significant at the .05 level of significance.

Table 4

Fruit/Vegetable Consumption SOC for Respondents With and Without Hypertension

Hypertension	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperten.	6	10.5	16	28.1	22	38.6	13	22.8
Without Hyperten.	21	10.8	54	27.8	63	32.5	56	28.9
Total	27	10.8	70	27.9	85	33.9	69	27.5

Chi-square=1.080, df=3, p=.782

Table 5

Fruit/Vegetable Consumption SOC for Respondents With and Without Hypercholesterolemia

Hyperchol.	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperchol.	6	9.8	14	23.0	26	42.6	15	24.6
Without Hyperchol.	21	11.1	56	29.5	59	31.1	54	28.4
Total	27	10.8	70	27.9	85	33.9	69	27.5

Chi-square=2.840, df=3, p=.417

Little difference was found between respondents with and without hypercholesterolemia (Table 5). A slightly higher percentage of respondents with hypercholesterolemia were in the preparation stage compared to those without hypercholesterolemia (42.6% and 31.1%, respectively). However, for all other stages, the two groups were very similar. Overall, the differences between those with and without hypercholesterolemia for fruit/vegetable stages of change were not found to be statistically significant at the .05 level of significance.

Little difference was found between overweight and non-overweight respondents (Table 6). The percentages for overweight and non-overweight respondents were nearly the same across all stages, with the greatest percentage of both groups in the preparation stage (34.1% and 33.8%, respectively). Overall, the differences between overweight and non-overweight respondents for fruit/vegetable stages of change were not found to be statistically significant at the .05 level of significance.

High-Fat Food Consumption Stages of Change

For the high-fat food consumption risk factor stages of change, for the total sample group, the greatest percentage of respondents were in the action/maintenance stage (31.3%), which indicated that they planned on continuing to maintain a low consumption of high-fat foods (Table 7).

Little difference was found between respondents with and without hypertension. For those with hypertension, the greatest percentage of

Table 6

Fruit/Vegetable Consumption SOC for Overweight and Non-Overweight Respondents

Overweight	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Overweight	10	11.0	28	30.8	31	34.1	22	24.2
Non-overweight	17	10.6	42	26.3	54	33.8	47	29.4
Total	27	10.8	70	27.9	85	33.9	69	27.5

Chi-square=1.004, df=3, p=.800

Table 7

High-Fat Food Consumption SOC for Respondents With and Without Hypertension

Hypertension	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperten.	4	7.0	19	33.3	15	26.3	19	33.3
Without Hyperten.	20	10.3	57	29.2	58	29.7	60	30.8
Total	24	9.5	76	30.2	73	29.0	79	31.3

Chi-square=1.003, df=3, p=.800

respondents were either in the contemplation or action/maintenance stages, with 33.3% in each of those stages. For those respondents without hypertension, the greatest percentage (30.8%) were in the action/maintenance stage. Overall, the differences between those with and without hypertension for high-fat food consumption stages of change were not found to be statistically significant at the .05 level of significance.

Little difference was found between respondents with and without hypercholesterolemia (Table 8). The greatest percentage of respondents diagnosed with hypercholesterolemia indicated that they were in the preparation stage (36.1%), while the greatest percentage of respondents without hypercholesterolemia indicated that they were in the action/maintenance stage (31.4%). Overall, the differences between those with and without hypercholesterolemia for high-fat food consumption stages of change were not found to be statistically significant at the .05 level of significance.

Small differences were found between overweight and non-overweight respondents (Table 9). The greatest percentage of overweight respondents were in the contemplation stage (37.4%), whereas, the greatest percentage of non-overweight respondents were in the action/maintenance stage (36.0%). The greatest difference between the two groups was found for the action/maintenance stage, with only 23.1% of the overweight respondents in this stage compared to 36.0% of the non-overweight group. Overall, the differences between overweight and non-overweight respondents for high-fat food

Table 8

High-Fat Food Consumption SOC for Respondents With and Without Hypercholesterolemia

Hyperchol.	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperchol.	3	4.9	17	27.9	22	36.1	19	31.1
Without Hyperchol.	21	11.0	59	30.9	51	26.7	60	31.4
Total	24	9.5	76	30.2	73	29.0	79	31.3

Chi-square=3.333, df=3, p=.343

Table 9

High-Fat Food Consumption SOC for Overweight and Non-Overweight Respondents

Overweight	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Overweight	6	6.6	34	37.4	30	33.0	21	23.1
Non-overweight	18	11.2	42	26.1	43	26.7	58	36.0
Total	24	9.5	76	30.2	73	29.0	79	31.3

Chi-square=7.631, df=3, p=.054

consumption stages of change were found to be statistically significant at the .05 level of significance.

Exercise Stages of Change

For exercise risk factor stages of change, for the total sample group, the greatest percentage of respondents were in the action/maintenance stage of change (31.9%), which indicated that they planned on continuing to maintain a moderate-to-high level of exercise (Table 10).

Little difference was found between respondents with and without hypertension. The greatest percentage of respondents diagnosed with hypertension indicated that they were in the preparation stage (32.3%). The greatest percentage of those without hypertension indicated that they were in either the contemplation stage or the action/maintenance stage, with 30.4% in each of those stages. Overall, the differences for exercise stages of change and hypertension were not found to be statistically significant at the .05 level of significance.

When comparing respondents with and without hypercholesterolemia, some moderate differences were found in stages of change for exercise (Table 11). While 32.1% of the respondents without hypercholesterolemia indicated that they were in the contemplation stage, only 23.0% of the respondents with hypercholesterolemia indicated that they were in that stage. On the other hand, 37.7% of the respondents with hypercholesterolemia indicated that they were in

Table 10

Exercise SOC for Respondents With and Without Hypertension

Hypertension	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperten.	7	12.5	17	30.4	15	26.8	17	30.4
Without Hyperten.	20	10.3	58	29.7	54	27.7	63	32.3
Total	27	10.8	75	29.9	69	27.5	80	31.9

Chi-square=.274, df=3, p=.965

Table 11

Exercise SOC for Respondents With and Without Hypercholesterolemia

Hyperchol.	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperchol.	5	8.2	14	23.0	23	37.7	19	31.1
Without Hyperchol.	22	11.6	61	32.1	46	24.2	61	32.1
Total	27	10.8	75	29.9	69	27.5	80	31.9

Chi-square=4.858, df=3, p=.182

the preparation stage, while only 24.2% of the respondents without hypercholesterolemia indicated that they were in that stage. Overall, the differences between those with and without hypercholesterolemia for exercise stages of change were not found to be statistically significant at the .05 level of significance.

Moderate differences were found between respondents diagnosed as being overweight compared to those not overweight (Table 12). These differences were found in the contemplation and action/maintenance stages. The greatest percentage of overweight respondents indicated that they were in the contemplation stage, at 38.9%, while only 24.8% of the non-overweight respondents indicated that they were in that same stage. The greatest percentage of non-overweight respondents indicated that they were in the action/maintenance stage, at 32.9%; the overweight respondents were very similar for this stage of change, with 30.0% of them indicating that they were in that same stage. Overall, the differences between overweight and non-overweight respondents for exercise stages of change were not found to be statistically significant at the .05 level of significance.

Weight and/or Body Fat Stages of Change

For weight and/or body fat stages of change, for the total sample group, the greatest percentage of respondents were in the preparation stage of change

Table 12

Exercise SOC for Overweight and Non-Overweight Respondents

Overweight	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Overweight	7	7.8	35	38.9	21	23.3	27	30.0
Non-overweight	20	12.4	40	24.8	48	29.8	53	32.9
Total	27	10.8	75	29.9	69	27.5	80	31.9

Chi-square=6.005, df=3, p=.111

Table 13

Weight and Body Fat SOC for Respondents With and Without Hypertension

Hypertension	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperten.	4	7.0	13	22.8	32	56.1	8	14.0
Without Hyperten.	11	5.7	68	35.2	65	33.7	49	25.4
Total	15	6.0	81	32.4	97	38.8	57	22.8

Chi-square=10.434, df=3, p=.015

(38.8%), which indicated that they intended to lose weight or reduce body fat within the next 30 days (Table 13).

When respondents with hypertension were compared to those without hypertension, some differences were found. The majority of the respondents with hypertension indicated that they were in the preparation stage of change, at 56.1%, while only 33.7% of those without hypertension were in that stage. The greatest percentage of respondents without hypertension were in the contemplation stage, at 35.2%, while only 22.8% of the respondents with hypertension indicated that they were in that stage. In addition, 25.4% of those without hypertension indicated that they were in the action/maintenance stage, while only 14.0% of those with hypertension indicated they were in that stage. Overall, the differences between those with and without hypertension for weight and/or body fat stages of change were found to be statistically significant at the .05 level of significance.

When comparing respondents with and without hypercholesterolemia, little difference was found (Table 14). The greatest percentage of respondents both with and without hypercholesterolemia indicated they were in the preparation stage (47.5% and 36.0%, respectively). One notable difference between the two groups was found for the precontemplation stage, with 7.4% of those without hypercholesterolemia indicating they were in this stage, while only 1.6% of the respondents with hypercholesterolemia indicated they were in this stage. Overall, the differences between those with and without hypercholesterolemia for

Table 14

Weight and Body Fat SOC for Respondents With and Without Hypercholesterolemia

Hyperchol.	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperchol.	1	1.6	19	31.1	29	47.5	12	19.7
Without Hyperchol.	14	7.4	62	32.8	68	36.0	45	23.8
Total	15	6.0	81	32.4	97	38.8	57	22.8

Chi-square=4.531, df=3, p=.210

Table 15

Weight and Body Fat SOC for Overweight and Non-Overweight Respondents

Overweight	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Overweight	2	2.2	34	37.4	46	50.5	9	9.9
Non-overweight	13	8.2	47	29.6	51	32.1	48	30.2
Total	15	6.0	81	32.4	97	38.8	57	22.8

Chi-square=20.085, df=3, p=.000

weight and/or body fat stages of change were not found to be statistically significant at the .05 level of significance.

When comparing overweight versus non-overweight respondents, some moderate differences were found (Table 15). Even though the greatest percentages of both groups were in the preparation stage, the differences between the groups for each of the four stages were relatively significant. These differences were found to be particularly large for the preparation stage (50.5% of the overweight group versus 32.1% of the non-overweight group) and the action/maintenance stage (9.9% of the overweight group versus 30.2% of the non-overweight group). Overall, the differences between overweight and non-overweight respondents for weight and/or body fat stages of change were found to be statistically significant at the .05 level of significance.

Tobacco Use Stages of Change

For tobacco use stages of change, those who indicated they were tobacco users were examined regarding their stages of change for this risk factor. Of this tobacco users' subsample, the greatest percentage of respondents were in the precontemplation stage of change (42.9%), which indicated that they did not have any plans to quit using tobacco products within the next six months (Table 16).

Little difference was found between tobacco-using respondents with and without hypertension. The greatest percentage of respondents that were tobacco users with hypertension indicated that they were either in the precontemplation or

Table 16

Tobacco Use SOC for Respondents With and Without Hypertension

Hypertension	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperten.	2	40.0	2	40.0			1	20.0
Without Hyperten.	7	43.8	5	31.3	2	12.5	2	12.5
Total	9	42.9	7	33.3	2	9.5	3	14.3

Chi-square=.875, df=3, p=.831

contemplation stages (tied at 40.0%), whereas the greatest percentage of tobacco users without hypertension indicated that they were in the precontemplation stage (43.8%). None of the tobacco users diagnosed with hypertension were in the preparation stage, while 12.5% of the respondents without hypertension indicated that they were in that stage. Overall, the differences between tobacco users with and without hypertension for tobacco use stages of change were not found to be statistically significant at the .05 level of significance.

Some differences were found for tobacco use stages of change between tobacco users diagnosed with and without hypercholesterolemia (Table 17). The greatest percentage of tobacco users in both groups indicated they were in the precontemplation stage, with only a slight difference in the percentages between these two groups (37.5% for those with hypercholesterolemia and 46.2% for

Table 17

Tobacco Use SOC for Respondents With and Without Hypercholesterolemia

Hyperchol.	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
With Hyperchol.	3	37.5	2	25.0	2	25.0	1	12.5
Without Hyperchol.	6	46.2	5	38.5			2	15.4
Total	9	42.9	7	33.3	2	9.5	3	14.3

Chi-square=3.635, df=3, p=.304

those without hypercholesterolemia). However, some moderate differences were found between the two groups for the preparation and contemplation stages. Of those tobacco users without hypercholesterolemia, none of the respondents indicated they were in the preparation stage of change, whereas 25.0% of the respondents with hypercholesterolemia indicated they were in that stage.

Another moderate difference between respondents with and without hypercholesterolemia was found in the contemplation stage, with 25.0% of those with hypercholesterolemia indicating they were in this stage, while only 38.5% of those without hypercholesterolemia indicated that they were in this stage.

Overall, the differences between tobacco users with and without hypercholesterolemia for tobacco use stages of change were not found to be statistically significant at the .05 level of significance.

Table 18

Tobacco Use SOC with Overweight and Non-Overweight Respondents

Overweight	Precont.		Contem.		Prep.		Act/Main.	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Overweight	1	20.0	2	40.0			2	40.0
Non-overweight	8	50.0	5	31.3	2	12.5	1	6.3
Total	9	42.9	7	33.3	2	9.5	3	14.3

Chi-square=4.550, df=3, p=.208

Some differences for the tobacco use risk factor stages of change were found between overweight and non-overweight tobacco users (Table 18). The greatest percentages of overweight tobacco users were in either the contemplation or action/maintenance stages, with 40.0% in each of those stages. While the greatest percentage of non-overweight tobacco users indicated they were in the contemplation stage, at 31.3%, only 6.3% of the non-overweight tobacco users were in the action/maintenance stage of change. Half of the non-overweight tobacco users indicated they were in the precontemplation stage (50.0%), while only 20.0% of the overweight tobacco users indicated that they were in that stage. Of those that were overweight tobacco users, none of the respondents were in the preparation stage of change, while 12.5% of the non-overweight tobacco users were in that stage. Overall, the differences between

overweight and non-overweight tobacco users for tobacco use stages of change were not found to be statistically significant at the .05 level of significance.

Some additional comments regarding the study results related to tobacco users versus non-users are warranted. Of the 210 respondents who indicated they were not using tobacco products, a surprising result was found: 1.9% of this group indicated that they were in the precontemplation stage of change for tobacco use (i.e., they were not thinking about quitting tobacco use) and .5% indicated they were in the preparation stage for tobacco use (i.e., they were planning on quitting tobacco use in the next 30 days). Since none of those who identified themselves as non-users should be in either of these two stages (i.e., they should all be in the action/maintenance stage), this finding suggests that these individuals either had incorrectly identified themselves as non-tobacco users, or had not understood the stages of change question related to tobacco use. It should also be noted that since the number of tobacco users in this study sample was relatively small ($n=21$), the results of the chi-square analyses for this risk factor may be questionable.

Summary

The purpose of this study was to compare the differences between individuals with and without chronic health conditions (diagnosis of hypertension, hypercholesterolemia, and overweight) for their health behavior stages of change

for exercise, diet, weight loss, and tobacco use. The sample used for the study was employees of a west Texas independent school district.

The data analyses revealed that statistically significant differences at the .05 level of significance existed for (1) stages of change for high-fat food consumption for overweight versus non-overweight respondents, (2) stages of change for weight and/or body fat for hypertensive versus non-hypertensive respondents, and (3) stages of change for weight and/or body fat for overweight versus non-overweight respondents.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a summary of the study, a discussion of the findings, conclusions drawn from the study, and recommendations for future research.

Summary of the Study

The purpose of this study was to compare the differences between individuals with and without chronic health conditions (diagnosis of hypertension, hypercholesterolemia, and overweight) for their health behavior stages of change for exercise, diet, weight loss, and tobacco use. The sample used for the study was employees of a west Texas independent school district. The instrument used for the data collection in this study was a self-report survey questionnaire developed by the project director of the Texas Department of Health (TDH) evaluation project. The 111-item survey included items on demographics (age, gender, race/ethnicity, job type); personal and family history of chronic disease conditions (cancer, diabetes, heart disease, hypertension, hypercholesterolemia, overweight); health risk behaviors related to diet, exercise, weight, and tobacco use; stages of change (precontemplation, contemplation, preparation,

action/maintenance) related to those health risk behaviors; health/fitness program interests; participation in worksite health promotion programs; and an open-ended question soliciting other comments. For this study, the items from the survey questionnaire that were used were: (a) demographics; (b) personal history of hypertension, hypercholesterolemia, and being overweight; and (c) stages of change for diet (fruit and vegetable consumption, high-fat food consumption), exercise, weight/body-fat control, and tobacco use.

Using the data collected from the respondents, the differences between respondents diagnosed with and without the three chronic health conditions and their stages of change for the five risk factors were examined. The data was analyzed using descriptive statistics. In addition, chi-square tests were performed to determine if significant differences in stages of change for the five risk factors existed for those with the chronic health condition versus those without the condition. Statistical significance was determined at the $p=.05$ level.

Of the 255 respondents, about one-fourth had either hypertension or hypercholesterolemia, and about one-third of them were diagnosed as being obese. In terms of risk factors of the 255 respondents, almost two-thirds were at risk for not eating five servings of fruits or vegetables a day, almost one-half of them consumed too many high-fat foods daily, about one-fourth did not exercise at least 30 minutes per day most days of the week, almost one-third were overweight, and about one-tenth used tobacco products.

For four of the five risk factors, the majority of the respondents were in either the preparation or action/maintenance stages of change. The exception was for tobacco use, for which the majority of the tobacco-using respondents were in the precontemplation stage. When chi-square analyses were used to determine if differences existed between those respondents with one of the three chronic health conditions versus those without each of the conditions for their stage of change, statistically significant differences ($p=.05$) were found for high-fat food consumption stages of change between overweight and non-overweight respondents, weight and/or body fat stages of change between respondents with and without hypertension, and weight and/or body fat stages of change between overweight and non-overweight respondents.

The results of this study indicate that respondents diagnosed with hypertension, hypercholesterolemia, and overweight were, for the most part, no more likely to be (1) contemplating taking action, (2) preparing to take action, or (3) already taking action to change their behavioral risk factors for diet, exercise, weight and/or body fat, or tobacco use than respondents without those conditions. Three exceptions to this trend among the respondents were found: hypertensives were more likely to be in progressed stages of change (i.e., preparation or action/maintenance) for weight/body fat, and non-overweight respondents were more likely to be in progressed stages of change for high-fat diet and for weight/body fat.

Discussion

Some possible explanations may exist for the lack of differences found for those with and without chronic health conditions regarding most of the risk factor stages of change. First, for those respondents diagnosed with a chronic health condition, such as hypertension, hypercholesterolemia, and overweight, there may be compliance issues in which emotional and practical needs, whether recognized or not, sometimes override desires to follow medical advice and reduce risk factors (Noble & Hamilton, 1983). Denial and rationalization may block an individual's ability to clearly understand and accept medical instructions (Noble & Hamilton, 1983). Secondly, for those respondents diagnosed with a chronic health condition, they may be in denial and resisting change. They may lack information about their problem, and may intend to maintain ignorant bliss at all costs (Prochaska et al., 1994). Thirdly, even though their physicians had diagnosed them with the chronic health condition, the respondents may not have been informed of all the ways of reducing risk factors.

Concerning the finding that hypertensive respondents were more likely to be in progressed stages of change for weight/body fat than non-hypertensives, the difference may be the result of weight-loss recommendations they had received from their physician. According to Nieman (1990), being overweight is the environmental factor most often identified as contributing to hypertension, and most individuals that are diagnosed with hypertension are told that they need to adopt lifestyle changes that will lower their blood pressure, including weight

loss. Even small weight losses can lower blood pressure significantly in overweight hypertensives (The New Wellness Encyclopedia, 1995). In fact, one study showed that the majority of mildly overweight hypertensives who lost moderate amounts of body weight could even control their blood pressure without medication (Nieman, 1990). Therefore, this may explain why those with hypertension were more likely to be in a more progressed stage of change for weight and/or body fat than those without hypertension.

Regarding the finding that non-overweight respondents were more likely to be in progressed stages of change for high-fat diet than those who were overweight, the difference may be due to non-overweight individuals being successful in controlling their weight because they were inclined to restrict their intake of high-fat foods. In other words, their intended consumption of low-fat diets may be considered by them to be an effective approach to weight control. In addition, there is some evidence that overweight people tend to consume more calories than normal-weight people, choosing larger portions of rich foods that are high in fats and sugars (Nieman, 1990). Consequently, this may explain the significant difference between overweight and non-overweight respondents for high-fat food consumption stages of change.

Concerning the finding that non-overweight respondents were more likely to be in progressed stages of change for weight/body fat than those who were overweight, the difference may be the result of many non-overweight individuals' obsession with keeping their weight down. Because the American obsession

with slimness has become so intense, many Americans are attempting to lose weight, whether they are overweight or not. At any given time, 2.5 million Americans are estimated to be dieting to lose weight (Nieman, 1990). According to one study, 25% of the adult men and 50% of the adult women reported being on a diet (Fahey, et al., 1997). Therefore, this may explain the significant difference between overweight and non-overweight respondents for the weight and/or body fat stages of change.

Conclusions

Using the Pearson chi-square test, the differences between respondents with and without one of three chronic health conditions (diagnosis of hypertension, hypercholesterolemia, and overweight) regarding their stages of change for each of the five risk factors were tested for statistical significance at the .05 level. Based on the results of these analyses of the data, the following conclusions can be made regarding the research questions posed for this study:

1. No difference exists between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for fruit and vegetable consumption.
2. No difference exists between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for fruit and vegetable consumption.

3. No difference exists between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for fruit and vegetable consumption.
4. No difference exists between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for high-fat food consumption.
5. No difference exists between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for high-fat food consumption.
6. There is a difference between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for high-fat food consumption. This difference is statistically significant at the $p=.05$ level.
7. There is a difference between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for weight/body fat. This difference is statistically significant at the $p=.05$ level.
8. No difference exists between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for weight/body fat.
9. There is a difference between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of

change for weight/body fat. This difference is statistically significant at the $p=.05$ level.

10. No difference exists between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for exercise.
11. No difference exists between individuals diagnosed with hypercholesterolemia and those not diagnosed with this condition for health behavior stages of change for exercise.
12. No difference exists between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for exercise.
13. No difference exists between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for tobacco use.
14. No difference exists between individuals diagnosed with hypertension and those not diagnosed with this condition for health behavior stages of change for tobacco use.
15. No difference exists between individuals diagnosed as overweight and those not diagnosed with this condition for health behavior stages of change for tobacco use.

The findings from this study suggest that, for the most part, the fact that an individual has a chronic health condition does not seem to affect his/her

predisposition to do something to reduce the associated health risk factor. Therefore, in their worksite-based programs, health promotion professionals need to place more emphasis on increasing the awareness of these chronic-condition individuals regarding the relationship between risk and health status. Regardless of whether or not they have a chronic disease condition, the employees' readiness to change health behavior risk factors should be evaluated, and appropriate programs must be designed which address those individuals' various stages of change (Boyle et al., 1998).

Recommendations for Further Research Studies

In order for health educators to develop effective behavior change risk reduction programs, additional research in this area needs to be conducted. Based on the findings and conclusions from this study, recommendations for further research studies are as follows:

- (1) Conduct similar studies with different school districts in other geographical areas.
- (2) Conduct similar studies with worksite populations that are different in size and type of business.
- (3) Conduct similar studies in which additional variables, such as gender, race, job title, and age, are examined as potential factors which may influence health behavior stages of change.

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APPENDICES

APPENDIX A

Human Subjects Review Committee Approval

**TEXAS WOMAN'S
UNIVERSITY**
DENTON / DALLAS / HOUSTON

HUMAN SUBJECTS
REVIEW COMMITTEE
P.O. Box 425619
Denton, TX 76204-5619
Phone: 940/898-3377
Fax: 940/898-3416

September 22, 2000

Ms. Janie Crosmer
1730 Creekbend Dr.
Lewisville, TX 75067

Dear Ms. Crosmer:

*Re: The Relationship Between Chronic Health Conditions and Health Behavior Stages of Change
Among Employees of a West Texas Independent School District*

The above referenced study has been reviewed by a committee of the Institutional Review Board (IRB) and was determined to be exempt from further TWU IRB review.

If applicable, agency approval letters obtained should be submitted to the IRB upon receipt prior to any data collection at that agency. Because you do not utilize a signed consent form for your study, the filing of signatures of subjects with the IRB is not required.

Another review by the IRB is required if your project changes. If you have any questions, please feel free to call the Institutional Review Board at the phone number listed above.

Sincerely,



Dr. Linda Rubin, Chair
Institutional Review Board - Denton

cc. Dr. Susan Ward, Department of Health Studies
Dr. Robin Rager, Department of Health Studies
Graduate School

APPENDIX B
Survey Questionnaire

Note: The name of the school district, and the school district's wellness coordinator have been removed to protect anonymity.]

The return of your completed questionnaire constitutes your informed consent to act as a participant in this research.

XXXX XXXXXXXX XISD

~ Program Evaluation Survey ~

Dear XISD Employee:

During the past school year, XISD has provided a variety of activities and resources as part of our employee wellness program. The Texas Department of Health (TDH) has requested that we conduct this evaluation of the worksite wellness program supported by the TDH mini-grant during the past school year. The purpose of this evaluation is to 1) measure the impact of our school worksite program, and 2) provide us with useful information for planning future wellness programming.

This questionnaire should take about 10 minutes for you to complete. Your participation in this survey is voluntary. Since we are not requesting your name on the questionnaire, your responses will be anonymous – we will not know the identity of anyone completing this survey.

Please help us by completing this questionnaire **even if you did not participate** in any of the employee wellness program offerings, so that we can get input from all XISD employees. You can contact me at (XXX) XXX-XXXX if you have any questions.

-- XXXX XXXX

DIRECTIONS: Please complete all sections of this questionnaire, and return it to XXX, by October 10.

1. Work Location: _____
2. Job Type: ☐ Administration ☐ Cafeteria ☐ Clerical ☐ Custodial/Maintenance
☐ Professional ☐ Paraprofessional ☐ Transportation ☐ Retired
☐ Other: _____
3. Age: _____ 4. Gender: ☐ Male ☐ Female

5. Race/Ethnicity: ☐ African American or Black ☐ Hispanic
☐ American Indian or Alaska Native ☐ White
☐ Asian or Pacific Islander ☐ Other: _____
6. Have you ever been informed by a health professional that you have any of the following health problems?
- | | | | |
|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| Cancer | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| Diabetes | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| Heart disease | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| High blood pressure | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| High cholesterol | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| More than 20 lbs. overweight | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
7. Has any member of your birth family (father/mother, sister/brother, grandparent) had any of the following health problems?
- | | | | |
|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| Cancer | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| Diabetes | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| Heart attack (before age 55) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| High blood pressure | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| High cholesterol | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
| More than 20 lbs. overweight | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
8. How many servings of vegetables do you eat during a typical day?
 (One serving = ½ cup of cooked vegetables or 1 cup of fresh vegetables)
- | | |
|---|---|
| <input type="checkbox"/> No servings per day | <input type="checkbox"/> 3-4 servings per day |
| <input type="checkbox"/> 1-2 servings per day | <input type="checkbox"/> 5 or more servings per day |
9. How many servings of fruit do you eat during a typical day?
 (One serving = 1 cup of fruit or ¾ cup of fruit juice)
- | | |
|---|---|
| <input type="checkbox"/> No servings per day | <input type="checkbox"/> 3-4 servings per day |
| <input type="checkbox"/> 1-2 servings per day | <input type="checkbox"/> 5 or more servings per day |
10. Approximately what proportion of the foods you consume during a typical day are "high-fat" (30% or more of the calories in the food are from fat)?
- | |
|---|
| <input type="checkbox"/> Less than half of the foods are high-fat |
| <input type="checkbox"/> About half of the foods are high-fat |
| <input type="checkbox"/> More than half of the foods are high-fat |
11. Do you exercise for a total combined time of at least 30 minutes per day most days of the week?
- | | |
|-----------------------------|--|
| <input type="checkbox"/> No | <input type="checkbox"/> Yes → Exercise level (check one): |
| | <input type="checkbox"/> light exercise (e.g., stretching; slow walking) |

- ☐ moderate exercise (e.g. brisk walking; jogging)
- ☐ heavy exercise (e.g., intensive running/cycling/swimming)

12. Do you currently smoke or use smokeless tobacco? ☐ Yes ☐ No
13. During the past 12 months, which of the following changes have you made to reduce your health risks? (Check all that apply):

- ☐ I'm eating more vegetables in my diet
- ☐ I'm eating more fruit in my diet
- ☐ I'm eating less high-fat food in my diet
- ☐ I've reduced the level of cholesterol in my blood
- ☐ I've increased my level of exercise (check one):
 - ☐ From sedentary (inactive) → light exercise
 - ☐ From light exercise → moderate exercise
 - ☐ From moderate exercise → heavy exercise
- ☐ I've reduced my weight and/or percentage body fat
- ☐ I've reduced my blood pressure
- ☐ I've stopped smoking
- ☐ I've stopped using smokeless tobacco (snuff, chewing tobacco)
- ☐ Other: _____

14. During the past 12 months, have you decreased your consumption of high-fat foods at cafeterias, restaurants, and other public eateries?

- ☐ Yes ☐ No → Why not? (Please check all that apply):
- ☐ I didn't like the lower-fat food choices on the menu
 - ☐ The high-fat food choices were more appealing to me
 - ☐ Other reason: _____

15. During the past 12 months, have you increased your consumption of fruits and/or vegetables at cafeterias, restaurants, and other public eateries?

- ☐ Yes ☐ No → Why not? (Please check all that apply):
- ☐ I didn't like the fruit or vegetable choices on the menu
 - ☐ The high-fat food choices were more appealing to me
 - ☐ Other reason: _____

16. Which of the following best describes your plans about eating fruits and/or vegetables?

- ☐ I don't have any plan to eat more fruits and/or vegetables within the next 6 months
- ☐ I'm thinking about eating more fruits and/or vegetables within the next 6 months
- ☐ I definitely intend to eat more fruits and/or vegetables within the next 30 days
- ☐ I plan to continue maintaining my healthy 5-a-day consumption of fruits/vegetables

17. Which of the following best describes your plans about eating high-fat foods?

- ☐ I don't have any plan to eat fewer high fat foods within the next 6 months
- ☐ I'm thinking about eating fewer high-fat foods within the next 6 months
- ☐ I definitely intend to eat fewer high-fat foods within the next 30 days
- ☐ I plan to continue maintaining my low consumption of high-fat foods.

18. Which of the following best describes your exercise plans?

- ☐ I don't have any plan to do more exercise within the next 6 months
- ☐ I'm thinking about doing more exercise within the next 6 months
- ☐ I definitely intend to do more exercise within the next 30 days
- ☐ I plan to continue maintaining my moderate-to-high level of exercise

19. Which of the following best describes your plans about your weight and/or body fat?

- ☐ I don't have any plan to lose weight or reduce my body fat within the next 6 months
- ☐ I'm thinking about losing weight or reduce my percent body fat within the next 6 months
- ☐ I definitely intend to lose weight or reduce my percent body fat within the next 30 days
- ☐ I plan to continue maintaining my healthy recommended weight or percent body fat

20. Which of the following best describes your plans about smoking or smokeless tobacco use?

- ☐ I don't have any plans to quit smoking/smokeless tobacco use within the next 6 months
- ☐ I'm thinking about quitting smoking/smokeless tobacco use within the next 6 months
- ☐ I definitely intend to quit smoking/smokeless tobacco use within the next 30 days
- ☐ I plan to continue maintaining my non-use of tobacco

21. During the past 12 months, have you participated in any XISD employee wellness activities or used any of the employee wellness resources?

☐ Yes → Which of the following activities or resources? (Check all that apply):

- ☐ Great American Smokeout quit-smoking day
- ☐ Scorecard program
- ☐ Walk Across Texas program
- ☐ Walk This Weigh program
- ☐ sponsored walk events (Am. Heart Assoc., Am. Cancer Soc., March of Dimes, etc.)
- ☐ competition games
- ☐ sports leagues
- ☐ fitness classes (on-site at XISD)
- ☐ fitness classes (off-site at community or college facilities)
- ☐ walking program
- ☐ breast cancer screening (mammogram)
- ☐ cholesterol screening
- ☐ hearing screening
- ☐ glaucoma screening

- ☐ prostate cancer screening
 - ☐ skin cancer screening
 - ☐ body composition info session ("Lifestyle Changes")
 - ☐ nutrition info session ("Choices: The Easy Challenge")
 - ☐ stress reduction info session ("The Healing Touch of Humor")
 - ☐ CPR training
 - ☐ Healthy Living pamphlets
 - ☐ wellness fair
 - ☐ other: _____
-

☐ No → Please indicate why you didn't participate in the employee wellness activities or use the wellness resources. (Check all that apply):

- ☐ I wasn't aware of the wellness activities/resources offered to employee
 - ☐ I'm too busy with my job responsibilities to participate in the activities
 - ☐ I wasn't interested in the activities/resources offered
 - ☐ I wasn't employed in XISD during the 1998/1999 school year
 - ☐ Other reason: _____
-

22. If they were offered in the future by XISD, in which of the following wellness program activities/resources would you participate or use? (Check all activities that you would participate in):

- ☐ Great American Smokeout quit-smoking day
- ☐ Scorecard program
- ☐ Walk Across Texas program
- ☐ Walk This Weigh program
- ☐ sponsored walk events (Am. Heart Assoc., Am. Cancer Soc., March of Dimes, etc.)
- ☐ competition games
- ☐ sports leagues
- ☐ fitness classes (on-site at XISD)
- ☐ fitness classes (off-site at community or college facilities)
- ☐ walking program
- ☐ bone density screening
- ☐ blood pressure screening
- ☐ breast cancer screening (mammogram)
- ☐ cholesterol screening
- ☐ comprehensive blood screening
- ☐ diabetes screening
- ☐ hearing screening
- ☐ glaucoma screening
- ☐ lung capacity screening
- ☐ prostate cancer screening
- ☐ skin cancer screening
- ☐ body composition info session
- ☐ nutrition info session

XISD future activities/resources (continued)

- ☐ stress reduction info session
- ☐ diabetes info session
- ☐ heart disease/stroke risk info session
- ☐ stress relief info session
- ☐ weight loss info session
- ☐ tobacco-quitting program
- ☐ CPR training
- ☐ wellness fair
- ☐ Healthy Living pamphlets
- ☐ medical self-care information
- ☐ wellness video lending library -> Which topics? _____
- ☐ other: _____

23. Any suggestions or comments you would like to provide to us:
