



The effectiveness of a faculty wellness program at Montana State University  
by Ralph Allen Brigham

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education  
Montana State University

© Copyright by Ralph Allen Brigham (1987)

Abstract:

The problem of this study was to determine the effectiveness of a wellness program for full-time faculty and administrators at Montana State University. Those included in the study had participated in the wellness program for a minimum of three quarters since the program began in spring quarter, 1985. A key concept was that of a health age discrepancy, which is simply the difference between one's actual age and one's health equivalent age based on one's lifestyle assessment.

A two-way analysis of variance was used as the method for testing the significance of the following four hypotheses: (1) wellness participation and health age discrepancy by gender, (2) wellness participation and seat belt use by gender, (3) wellness participation and absenteeism by gender, and (4) wellness participation and health care claim costs by gender.

A chi-square test of independence was used to test the significance of the following two hypotheses: (1) that the use of tobacco was independent of participation in the wellness program, and (2) that the use of alcohol was independent of participation in the wellness program.

The conclusions of this study suggested that males, in both the wellness participant category and the non-participant category, possessed a higher, positive health age discrepancy than did females in both categories. Tobacco and alcohol were not important factors when describing differences between groups. Wellness participation did not affect the rate of absenteeism nor did it influence the rate of health care claim costs for either males or females.

Recommendations for further study include: (1) replication on other campuses, different in size and geographic location (an urban setting is needed), (2) reasons for participation in wellness programs need to be explored, (3) national causes of illness and death need to be investigated in comparison to on-campus causes, and (4) this cohort should be followed longitudinally over the next five years.

THE EFFECTIVENESS OF A FACULTY WELLNESS PROGRAM  
AT MONTANA STATE UNIVERSITY

by

Ralph Allen Brigham

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

Doctor of Education

MONTANA STATE UNIVERSITY,  
Bozeman, Montana

November 1987

D 378  
B 7675

APPROVAL

of a thesis submitted by

Ralph Allen Brigham

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

Nov. 16, 1987  
Date

Dianne S. Peber  
Co-chairperson, Graduate Committee

Nov. 17, 1987  
Date

Ronald L. Robson  
Co-chairperson, Graduate Committee

Approved for the Major Department

Nov. 17, 1987  
Date

Ronald L. Robson  
Head, Major Department

Approved for the College of Graduate Studies

9 Dec. 1987  
Date

J. W. Malone  
Graduate Dean

## STATEMENT OF PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a doctoral degree at Montana State University, I agree that the Library shall make it available to borrowers under the rules of the Library. I further agree that copying of this thesis is allowable only for scholarly purposes, consistent with "fair use" as prescribed in the U. S. Copyright Law. Requests for extensive copying or reproduction of this thesis should be referred to University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan 48106, to whom I have granted "the exclusive right to reproduce and distribute copies of the dissertation in and from microfilm and the right to reproduce and distribute by abstract in any format."

Signature



Date

11-19-87

## ACKNOWLEDGEMENTS

This researcher wishes to acknowledge several persons who helped in the completion of this study. He is especially appreciative of Dr. Dianne Peters and Dr. Donald Robson, co-chairs of his committee, for their continuous encouragement as well as their friendship and guidance throughout the entire process. Special gratitude is expressed to Dr. Eric Strohmeyer. Particular thanks are also expressed to other members of the committee: Dr. Stephen Hample, Dr. Richard Horswill, Mr. William Johnstone, and Dr. Thomas Carroll.

The researcher thanks the International Foundation of Employee Benefit Plans for its monetary support of this endeavor. This money was very valuable in assisting this study to be completed.

A very deep appreciation is expressed to his wife, Susan, for her encouragement, understanding and moral support while this study was being completed. Recognition is also given to sons, Bob and Matt, for their patience while their father was engaged in this research. Gratitude is genuinely given to his father and mother, Robert and Margaret (recently deceased), for their lifelong emphasis on education and the desire that they both had to see this degree completed.

## TABLE OF CONTENTS

	Page
APPROVAL . . . . .	ii
STATEMENT OF PERMISSION TO USE . . . . .	iii
VITA . . . . .	iv
ACKNOWLEDGEMENTS . . . . .	v
TABLE OF CONTENTS . . . . .	vi
LIST OF TABLES . . . . .	viii
ABSTRACT . . . . .	x
1. INTRODUCTION . . . . .	1
Statement of Problem . . . . .	3
Need for Study . . . . .	4
Questions That Were Answered . . . . .	6
General Procedure . . . . .	7
Delimitations of the Study . . . . .	8
Limitations of the Study . . . . .	9
Definition of Terms . . . . .	11
2. REVIEW OF THE LITERATURE . . . . .	13
Rationale for Wellness Programs . . . . .	14
Wellness Programs and Their Benefits . . . . .	19
Improvement in Productivity . . . . .	20
Reduction of Benefit Costs . . . . .	22
Wellness Programs and Current Research . . . . .	23
3. PROCEDURES AND METHODOLOGY . . . . .	31
Introduction . . . . .	31
Population Description and Sampling	
Procedures . . . . .	32
Method of Collecting Data . . . . .	33
Health Risk Appraisal . . . . .	33
Absenteeism . . . . .	34
Health Care Costs . . . . .	35

Reporting the Data . . . . .	35
Method of Organizing Data . . . . .	38
Statistical Hypotheses . . . . .	38
Statistical Procedures . . . . .	42
Precautions for Accuracy . . . . .	43
4. ANALYSIS OF DATA . . . . .	44
Hypothesis One . . . . .	45
Hypothesis Two . . . . .	47
Hypothesis Three . . . . .	50
Hypothesis Four . . . . .	52
Hypothesis Five . . . . .	56
Hypothesis Six . . . . .	60
5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS . . . . .	64
Summary . . . . .	64
Findings and Conclusions . . . . .	66
Recommendations . . . . .	68
REFERENCES CITED . . . . .	72
APPENDICES . . . . .	78
Appendix A . . . . .	79
Appendix B . . . . .	82

## LIST OF TABLES

Table	Page
1. Table of The Leading Causes of Death in the United States . . . . .	15
2. Table of Means for Health Age Discrepancy According to Gender and Participation . . . . .	45
3. Two-way ANOVA Table of Health Age Discrepancy According to Gender and Participation . . . . .	46
4. Chi-Square Test of Independence Analysis for Males with Tobacco Use and Participation . . . . .	48
5. Chi-Square Test of Independence Analysis for Females with Tobacco Use and Participation . . . . .	49
6. Chi-Square Test of Independence Analysis for Males with Alcohol Use and Participation . . . . .	50
7. Chi-Square Test of Independence Analysis for Females with Alcohol Use and Participation . . . . .	51
8. Table of Means for Seat Belt Use According to Gender and Participation . . . . .	52
9. Two-way ANOVA Table of Seat Belt Use According to Gender and Participation . . . . .	53
10. One-way ANOVA Table of Wellness Participation According to Seat Belt Use and Gender . . . . .	54
11. One-way ANOVA Table of Wellness Non-Participation According to Seat Belt Use and Gender . . . . .	54
12. One-way ANOVA Table for Males According to Seat Belt Use and Participation . . . . .	55

13. One-way ANOVA Table for Females According to Seat Belt Use and Participation . . .	55
14. Table of Means for Absenteeism According to Gender and Participation . . . . .	57
15. Two-way ANOVA Table of Absenteeism According to Gender and Participation . . . . .	57
16. Table of Means for Absenteeism According to Gender and Participation Without Outliers . . . . .	59
17. Two-way ANOVA Table of Absenteeism According to Gender and Participation Without Outliers . . . . .	59
18. Table of Means for Health Care Claim Costs According to Gender and Participation . . . . .	60
19. Two-way ANOVA Table of Health Care Claim Costs According to Gender and Participation . . . . .	61
20. Table of Means for Health Care Claim Costs According to Gender and Participation Without Outliers . . . . .	62
21. Two-way ANOVA Table of Health Care Claim Costs According to Gender and Participation Without Outliers . . .	63

## ABSTRACT

The problem of this study was to determine the effectiveness of a wellness program for full-time faculty and administrators at Montana State University. Those included in the study had participated in the wellness program for a minimum of three quarters since the program began in spring quarter, 1985. A key concept was that of a health age discrepancy, which is simply the difference between one's actual age and one's health equivalent age based on one's lifestyle assessment.

A two-way analysis of variance was used as the method for testing the significance of the following four hypotheses: (1) wellness participation and health age discrepancy by gender, (2) wellness participation and seat belt use by gender, (3) wellness participation and absenteeism by gender, and (4) wellness participation and health care claim costs by gender.

A chi-square test of independence was used to test the significance of the following two hypotheses: (1) that the use of tobacco was independent of participation in the wellness program, and (2) that the use of alcohol was independent of participation in the wellness program.

The conclusions of this study suggested that males, in both the wellness participant category and the non-participant category, possessed a higher, positive health age discrepancy than did females in both categories. Tobacco and alcohol were not important factors when describing differences between groups. Wellness participation did not affect the rate of absenteeism nor did it influence the rate of health care claim costs for either males or females.

Recommendations for further study include: (1) replication on other campuses, different in size and geographic location (an urban setting is needed), (2) reasons for participation in wellness programs need to be explored, (3) national causes of illness and death need to be investigated in comparison to on-campus causes, and (4) this cohort should be followed longitudinally over the next five years.

## CHAPTER 1

## INTRODUCTION

Concern for the wellness of employees is on the increase in the workplaces of America. A major reason for this concern is the fast rising cost of employee health care. Higgins and Phillips (1979) estimated that premature employee death and employee illness and disability combine to cost companies approximately \$28 billion a year (p. 53). One leader in the wellness movement, Don Ardell (1984) reported that in 1977, United States' companies were paying an average of \$1,250 annually (including insurance) per employee for all health related costs, or a total of \$33 billion (p. 25). The U. S. Chamber of Commerce issued corresponding figures in 1983 of \$2,000 and \$78 billion, respectively. Opatz (1985) suggests that by the year 2000 we will be spending \$4,000 per person or one trillion dollars for our health care (p. 23).

These figures are one reason why industry has, over the past 5 years, devoted increased effort and money to developing employee wellness programs, which have been defined by Opatz (1985) as the

"process of adapting patterns of behavior that lead to improved health and life satisfaction" (p. 7).

The goals of wellness programs include: (1) developing a healthier lifestyle, (2) promoting a physiologically sound individual, and (3) reducing expenditures on illness related claims. Although many benefits of a wellness program are long-term and may not appear for up to 10 or 20 years, results of current research have indicated short-term (less than one year) benefits of healthier lifestyles and more physically fit individuals who have reduced illness expenditures (McMillen, 1986; Bernacki and Baun, 1984; Cox et al., 1981; Pauly et al., 1982).

Company sponsored physical fitness first surfaced in the literature when John H. Patterson, in the 1890's, instituted a physical fitness program at National Cash Register (National Cash Register, 1980). It consisted of daily 10 minute exercise breaks at 10:00 a.m. and also at 3:00 p.m. Patterson continued with his progressive idea for succeeding decades, but few others adopted his way of thinking. During the following half century interest in such programs languished.

The next significant event in the wellness movement came with the publication of Halbert L.

Dunn's High Level Wellness: An Alternative to Doctor's, Drugs, and Disease (1961). Although this publication laid the groundwork for professionals to pursue wellness in a more formal sense, it did not make a significant impact on the general public. Finally, over the past six years wellness programs have proliferated throughout corporate America and institutions of higher education are now beginning to adopt this movement.

Montana State University, in July, 1985, began contributing \$38.00 annually from each employee's health care premium to an "employee wellness program." Both the institution and its employees have invested resources (time, money, and effort) in this program in the belief that this investment will yield tangible benefits. These benefits can and should be measured both in terms of cost savings as well as the overall effectiveness of the program. The goals of the program are stated in Appendix A.

#### Statement of the Problem

The problem of this study was to determine the effectiveness of a wellness program for full-time faculty and administrators at Montana State University. Those included in the study had

participated in the wellness program for a minimum of three quarters since the program began in spring quarter, 1985. The study compared participants to non-participants on various physiological, lifestyle and economic components.

#### The Need for the Study

Several studies indicate that a wellness program can indeed reduce absenteeism, lower health claims, and achieve other results that more than justify the cost of the program. Further, virtually no studies on this topic have been conducted in terms of college and university employees, despite the fact that North American higher education is an 80 billion dollar, labor-intensive industry (The Condition of Education, 1984). Thus, it is important to determine carefully the effectiveness of a wellness program in a higher education setting. MSU's early progress in establishing a wellness program makes this study especially promising to everyone concerned with managing people and the costs associated with their working conditions.

The welfare of employees is important to all administrators within an institution of higher education. If employees' health risks can be

diminished, significant reductions in death and related disability, lost productivity, and cost for health care may be obtained. According to statistics cited by Thar (1984), "The nation's health bill consumed 10.8 percent of the gross national product (1983), or \$1,459 for each individual in the U. S." (p. i). In short, possibly the best defense against skyrocketing health care costs is to prevent illness. Opatz (1985) warned that "the current system is so ensconced (for-profit hospitals, medical schools, increasing illness identification technology) that the only long-term solution is to keep people away from it and thereby reduce its size and importance" (p. 31).

Studies in industry have shown the value of wellness programs within the workplace, but corresponding studies within the higher education sector are lacking. Current researchers have consistently stated the need for complete, well documented and well conducted studies (Fielding, 1982; Hoffman & Hobson, 1984; Metcalfe, 1985). The study of this innovative program at Montana State University hopes to document just how much influence, if any, a wellness program can have on changing the health habits of employees as evidenced through their

appraised age. Positive results could result in many institutions of higher education by moving from a passive to an active role in health care involvement through managerial participation and active intervention in employee health problems.

#### Questions That Were Answered

Three basic questions were addressed:

1. Can the health age discrepancy of participants in the wellness program, as measured by the Health Risk Appraisal be affected by participation in the wellness program?
2. Did participants have less absenteeism than non-participants?
3. Are health care claim costs for participants lower than for non-participants?

More specifically, participants and non-participants were compared in the following areas:

- I. Lifestyle factors
  - A. Appraised age
  - B. Tobacco usage
  - C. Alcohol usage
  - D. Seat belt usage

## II. Economic criteria

### A. Absenteeism

### B. Medical claim costs

In general, is the program effective for controlling rising health care costs and can the program improve the general health of MSU employees?

### General Procedure

All Montana State University employees and their spouses are eligible to participate in the wellness program. This retrospective study examined a select group of employees who have participated in the wellness program matched with employees who have not participated in any of the wellness activity programs.

In December, 1986, participants in the wellness program were asked to complete the Health Risk Appraisal (Appendix B) to collect certain physiological and lifestyle information and to calculate an appraised age. Ellis and Raines (1983) described an individual's appraised age as "the impact of an individual's behaviors on his or her life span (p. 31) and the result is an age that takes these health risk indicators into account. Risk age (Beery et al., 1981) has also been used for

describing life expectancy "being the age of an average person who has the same total risk of death."

From this group of participants, only those participants who have participated in a wellness class during a minimum of three quarters between September 1985 and December 1986 (five quarters) were used for the study. An element of commitment to wellness and physical activity was brought in to the study by making the three quarter minimum a requirement. An equal number of non-participating MSU employees were randomly selected to complete the same information once they met the matching pairs criteria. Medical claim and sick leave data will also be collected for these same individuals in both of these groups.

#### Delimitations of the Study

1. The study was delimited to on-campus full-time employees of Montana State University. The experimental group included those employees who participated in at least one wellness course per quarter for a minimum for three quarters between September, 1985 and December, 1986.

2. The Health Risk Appraisal was used to determine appraised age and gather lifestyle habit information.

#### Limitations of the Study

1. Self-selectivity was one limitation of this study, as it has been for most studies of this type (Haskell & Blair, 1980, p. 112). In the experimental group, only those individuals who chose to participate will be evaluated against the control groups. The control group was selected using a matched pairs methodology.
2. The time-span of the study may influence the results. Long-term benefits of this program may not appear for up to 10 or 20 years while short-term results may be misleading. For example, in a publication by the Office of Disease Prevention and Health Promotion (Worksite Health Promotion, n. d., p. 5), Blue Cross/Blue Shield of Indiana reported a significant increase in health care costs in the first two

years, since the program identified illnesses that previously went undetected. After the second year health care costs then began a downward trend. LaRosa, Haines & Kiefhaber (1985, p. 236) claimed that a minimum of five years of program intervention is needed for controlled hypertensive workers. Madeleine Udeleff (1985) contends that "some results don't become apparent for anything from a year to five years" (p. 39). On the other hand several studies have shown sizeable cost savings in less than a year (Bernacki and Baun, 1984; Cox et al., 1981; Pauly et al., 1982; Bowne et al., 1984; McMillan, 1986).

3. The review of literature was limited to research reports published between 1979 and 1986. It was further limited, in most cases, to research journals reporting on actual wellness programs and not the popular literature on wellness and levels of physical activity.

Definition of Terms

"Appraised age" is the sum of "the impact of an individual's behaviors on his or her life span (Ellis and Raines, 1983, p. 31) and the result is an age that takes these health risk indicators into account.

"Wellness" may be defined as an attitude, an approach to life, self, work, and even to the way one copes with illness or injury. It may best be described as the attempt to achieve optimal health.

A "wellness program" is a planned program that encourages employees to change their lifestyle to increase the level of their health. "Health promotion" is also used to describe wellness programs.

"Health risk factors" are behavioral factors that lead to disease. Examples of health risk factors include smoking, excessive use of alcohol, and level of physical fitness.

"Health care benefits" refer to the saving of lives, reduction in health care costs, reductions in insurance, and enhancement of the quality of life.

"Risk indicator" (Goetz et al. 1980, p. 122) is any factor with consequences for a health-related risk.

"Risk age" (Beery et al., 1981) has been used for describing life expectancy "being the age of an average person who has the same total risk of death".

The level of participation in a wellness program needs definition. "High adherence" in this case means 2 or more times per week. "Low adherence" means 1 time or less per week, but still involved in the program. "Dropout" refers to the individual who began the wellness program, but for whatever reason discontinued participation.

"Nonparticipant" is the employee who has never been involved in the wellness program.

"Health Age Discrepancy" is used to describe the difference between actual age and appraised age. If an individual is 32 years old and his appraised age is 26, the health age discrepancy would be +6 years. Similarly, if the same 32 year old male had an appraised age of 40, his health age discrepancy would be -8.

"Sick leave" includes all days absent from work due to illness or injury of the employee. It may also mean an employee needed to miss work to care for a member of his or her immediate family.

## CHAPTER 2

## REVIEW OF RELATED LITERATURE

The purpose of this chapter is to review the literature associated with wellness programs. Most of the research has been initiated and carried out by individuals involved in the corporate sector; therefore, the quantity of literature on college and university wellness programs is rather limited. This review of literature will provide a base from which to evaluate developments in wellness programs in both the corporate and higher education settings.

The review of related literature presented in this dissertation will be divided into three parts: (1) those statements that show the need for health promotion and cost containment in the workplace, (2) that literature which reveals the potential benefits of a wellness program, and (3) that literature which contains studies similar to this dissertation, whether in the corporate or higher education setting.

### Rationale for Wellness Programs

Many different facts may be specified in the need for wellness programs in all types of work settings. The United States is experiencing an increasingly aging population, a population that is more stressed, less healthy, and dying of lifestyle causes rather than infectious and contagious diseases.

Pelletier (1979), in his book Holistic Medicine, describes four measures that he considers central to wellness or holistic, preventive medicine. These measures are "lifestyle change, and management of stress, diet, and exercise" (p. 64). These measures have been used as a basis for evaluating wellness programs, either in part or in total.

Infectious and contagious diseases as the leading cause of death have been replaced by life style factors (Weisensee & Ward, 1985 p. 9), such as heart disease, cancer, stroke, and accidents. The Department of Health, Education, and Welfare reported that the leading causes of death in the United States during 1975 were as listed in Table 1:

Table 1. Table from the Department of Health, Education and Welfare Showing the Leading Causes of Death in the United States.

<u>Cause of Death</u>	<u>Percentage of All Deaths</u>
1. Heart disease	37.8%
2. Cancer	19.3%
3. Stroke	10.3%
4. Accidents other than motor vehicle accidents	3.0%
5. Influenza and pneumonia	2.9%
6. Motor vehicle accidents	2.4%
7. Diabetes	1.9%
8. Cirrhosis of the liver	1.7%
9. Arteriosclerosis	1.5%
10. Suicide	1.4%

Since many of these causes of death are greatly affected by lifestyle, several lifestyle factors are usually addressed in a wellness program. Hettler (1980, p. 8), discusses the factors influencing lifestyle in relation to health. An overwhelming 53% of those factors relate to lifestyle factors which can be controlled by the individual. Only 16% of the factors are things that are beyond the individual's control such as genes and body makeup. The health care system accounts for 10% of the factors with environmentally caused factors completing this analysis with 21%.

U. S. Senator William S. Cohen recently proposed the Preventive Health Care Incentive Act which proposes to reduce the number of individuals

who turn to doctors for care. Cohen (1985) speaks very clearly and concisely about the problem.

The primary public health enemy of the 1980s is chronic, degenerative disease. Prevention of today's illness depends more upon the actions of the individual than the actions of the community. Many of our most serious health problems are directly related to unhealthy behaviors - smoking, overeating, lack of exercise, and abuse of drugs and alcohol. Today, more than ever, the way we die is directly related to the way we live (p. 213).

High blood pressure is a leading problem in health care. A Montana Study (Healthy Montanans, 1984) admitted that,

approximately 22% of adult Montanans reported they had been told they had high blood pressure. Of those persons who indicated they were hypertensive, 66.3% said they had been told more than once and 33.7% reported being told only once. Only 2.3% of Montanans have an uncontrolled hypertension problem. Untreated hypertension is the single largest contributor to stroke and a major contributor to heart disease and kidney failure (p. 5).

High blood pressure was often a tell-tale sign of excess stress within an individual reported Cooper and Melhuish (1984, p. 103) when they concluded that there are two different methods of internalizing stress between men and women. They disclosed that men tend to become physically ill when confronted with stress-related illness and women tend

to develop mental illness when faced with the same situation.

Cigarette smoking is another serious threat to good health in the state of Montana. Healthy Montanans (1984) warned that:

Cigarette smoking is the largest single preventable cause of illness and premature death in Montana. It is the major single cause of cancer morbidity and is a causal factor for coronary heart disease and arteriosclerotic peripheral vascular disease; is associated with increased risk of coronary heart disease; and is the most important cause of chronic obstructive lung disease. Cigarette smoking increases the risk of bladder, pancreatic, and renal cancer, and peptic ulcer disease. Maternal smoking during pregnancy causes: retarded fetal growth; and increased risk for spontaneous abortion, fetal death, and neonatal death; and possibly, slight impairment of growth and development during early childhood. In Montana, 29.3% of adults currently smoke cigarettes. Nearly 79% of those smokers smoke less than one pack a day, while 19% smoke one to two packs, and 2% smoke more than two packs a day (p. 59).

The Health Consequences of Smoking (1980), a document by the Surgeon General, reported that "cigarette smokers experience a 70 percent greater coronary heart disease death rate than do nonsmokers" (p. 7). All of the above-mentioned information clearly demonstrates that smoking is a grave health problem in the U. S. today.

Members of the Health Care Cost Containment

Advisory Council for the State of Montana (1986) published the following facts on tobacco:

Smokers are absent from work fifty percent more often than non-smokers; they also have twice as many job-related accidents. Their illnesses tend to be more serious; they have fifty percent more hospitalizations than non-smokers. It is estimated that each smoking employee costs his employer over \$4550 yearly in medical care costs, accidents, life insurance, disability benefits, absenteeism and lowered productivity (p. 3).

The abuse of alcohol is yet another proven problem for the people of Montana. Quoting again from Healthy Montanans (1984) the problem of alcohol is detailed below:

The abuse of alcohol and drugs is one of the state's most serious problems. It directly or indirectly involves almost every aspect of our physical, psychological, and social well-being. In 1983, cirrhosis, which is largely attributable to alcohol consumption, ranks as our 10th leading cause of death. Alcohol use is associated with cancer of the liver, pancreas, esophagus, and mouth. Alcohol consumption during pregnancy is associated with a wide range of possible harmful effects to the fetus -- decreased birth weight, spontaneous abortion, and physical defects (p. 64).

The concern regarding alcohol is quite prevalent in the circles of higher education. In 1984, Thoreson warned about the use of alcohol in higher education and the reluctance to confront

especially those professors at the senior-level. Thoreson charged that, "a common sight on the college campus is the friendly, harmless, 'in the sauce' former superstar" (p. 66). These academic "superstars" still have potential and cannot be left to waste, nor should the situation be allowed to happen in the first place.

Weight control is another area with which wellness programs have concern. Guidelines for proper weight standards are constantly changing, but, according to Dale Feuer (1985), associate editor of Training, 20% over ideal weight is a serious health threat" (p. 32). This component of wellness deals with both diet and exercise, and the planning and following of both programs in a responsible manner. Healthy Montanans (1984) stated that, "In 1982, 12% of the U. S. population was underweight and 21.1% were overweight. Of the overweight group, 23.4% were males and 20.3% were females" (p. 70).

#### Wellness Programs and Their Benefits

It is now appropriate to examine the potential benefits of wellness programs. Quality research demonstrating the effectiveness of employer-sponsored health promotion is rare. Most of the evidence about the success of wellness programs in

terms of providing a favorable return on investment is inconclusive. The key word when discussing the potential benefits of wellness programs is "potential". More well conducted and documented studies are needed before conclusive results can be stated about the actual benefits of wellness programs.

It is appropriate, nonetheless, to list potential benefits into the two categories. This breakdown was provided by Michael O'Donnell (Director of Health Promotion Services at San Jose Hospital and California representative to the American Association of Fitness Directors in Business and Industry) in the book Health Promotion in the Workplace which he co-authored with Thomas Ainsworth, M. D. (1984). The two categories of potential benefits are: improvement in productivity and reduction of benefit costs (pp. 11-13).

#### Improvement in Productivity

Reducing Absenteeism. Reductions in absenteeism may result from a decrease in the number of sick leaves or a decrease in the length of each sick leave taken. Schwartz (cited in Yeater, 1985) found that "absenteeism costs industry 95 million

lost hours per week, which is equivalent to 2.3% of total hours worked or \$7 billion a year" (p. 596).

Improving Morale. The morale of employees may be increased when the employer shows interest in providing more benefits for the employees. This increased morale can manifest itself in a greater desire on the part of the employee to perform better, to put in a full day's work, and to increase the quality of work produced.

Conserving Operating Costs. An enthusiastic and dedicated employee may be less inclined to waste institutional resources. Such behaviors can reduce operating costs.

Improving Ability to Perform. A healthier body has the potential to perform at a higher ability for a sustained period of time. Stress and worry may be reduced with a healthier body, again producing a worker more capable of performing with greater concentration and effectiveness.

Developing Higher Quality Staff. Healthier workers may perform more effectively and therefore be of more value to the institution. Employees in good health may use fewer sick days. Resignations,

transfers to other jobs and premature deaths may also be less frequent.

### Reduction of Benefit Costs

Reducing Health Insurance Costs. Many company's health insurance program premiums are based on the use of medical services and subsequent claims to the insurance company. With more health conscientious employees utilizing medical services less often the insurance companies can then lessen the need to increase premiums at the previous rates or perhaps reduce the premiums.

Lowering Life Insurance costs. Currently, a number of life insurance companies reduce premiums for individuals practicing healthy life-styles. Generally, these are only for individual policy holders. This practice may be introduced into group situations.

It is only natural and appropriate that wellness programs are promoted in the workplace. U. S. Senator William Cohen (1985) gives the following reasons for that appropriateness:

- (1) Most employees go to the workplace regularly,
- (2) Workers are given support through their co-

workers,

- (3) Environmental support such as office smoking policies may assist workers,
- (4) Convenience of access to facilities and institutional wellness programs make participation more convenient (p. 215).

#### Wellness Programs and Current Research

As stated earlier, the most valuable research concerning wellness programs and their effectiveness and/or cost savings and benefits has been in the corporate sector. Even there, evidence is slim and often not well substantiated. Wellness programs are not all alike and the goals of wellness programs are not all the same. Some programs work toward the cessation of smoking, others look to reduce alcohol abuse. Still others try to curb health costs. Weight reduction is yet another goal. Increased productivity, better physical conditioning, reduced disability are further reasons that wellness programs have been established. Kirkpatrick (1985, p. 450) hinted that many corporations are investigating wellness programs because of the possibilities of enhancing the profit margin. Indeed, the profit motive may have been an initial

reason for many corporations pursuing wellness programs.

The evaluation of these programs has been a thorn in the side of wellness advocates. Researchers have produced positive results, but because of the quality of the research those results have not held up under careful examination. In 1982, Jonathon Fielding, M.D., indicated his desire regarding the evaluation of wellness programs.

The best test would be to take a large number of habitually sedentary individuals, randomize them, get half of them to adopt and maintain a regular exercise habit for 10 to 20 years and compare morbidity and mortality in the exercise and control groups (p. 910).

Attributing results as causal would still only be speculative at this time (Hoffman & Hobson, 1984).

Research on all aspects of wellness is needed.

Metcalfe (1985) stressed the need for

"accountability, evaluation and research" (p. 5) in the ongoing measurement of program objectives.

When Baun and Landgreen (1983) reported a corporate fitness program at Tenneco, their goal was to develop a model at and for their corporate headquarters that could also be exported to their world-wide offices. Bernacki and Baun (1984) described early results in "The Relationship of Job

Performance to Exercise in a Corporate Fitness Program." This research indicated,

that in a group of white-collar workers in a corporation with a health and fitness program, (1) a positive association exists between above average job performance and exercise adherence and (2) a negative association exists between poor job performance and exercise adherence (p. 531).

This program at Tenneco measured 3,231 employees, but only for six months. The authors also found that absenteeism decreased and that the average reimbursement for medical costs had decreased. Researchers plan to continue this evaluation.

Cox, Shephard, and Corey's (1981) research, reported in Ergonomics, dealt with the influence of an employee fitness program upon fitness, productivity, and absenteeism. They concluded that the general fitness levels did increase. In the area of absenteeism, a significant decrease was in evidence. "The high adherents [to the fitness program] showed a 42% decrease of absenteeism" (p. 800). This endeavor was evaluated after only six months of operation with the above mentioned results. These researchers pointed out that, "Given 20% participation in an exercise class, there was a potential for a 1% reduction of company pay-roll

costs resulting from reduced turnover and absenteeism" (p. 795).

Edward Rhodes and Douglas Dunwoody (1980) described their research at a large company with seventy white-collar males. The research again dealt with physiological changes within an employee fitness program. Physiological improvements were detected, in fact 90% declared that they had the ability to work harder. More significant though was the decided improvement in the psychological realm where 63% had an increased ability to handle job tensions and related stress" (p. 336). Employees also disclosed an "improved outlook on the job, and an increased level of self-confidence as compared to pre-exercise feelings" (p. 336). Self-esteem purportedly increased in this study of an employee fitness program and it is hinted throughout the literature that possibly this is the most dynamic result of any wellness program.

Xerox ran a 14-week fitness program to test for improvement on certain physiological and psychological parameters. Pauly, Palmer, Wright, and Pfeiffer (1982) concluded that participants "experienced significant [positive] changes in levels of triglycerides and total cholesterol, resting heart

rate, resting systolic blood pressure" (p. 462) and also social self-concept. Interestingly, degrees of improvement in all measures except for the maximum oxygen capacity were unrelated to frequency of participation.

Bowne, Russell, Morgan, Optenberg, and Clarke (1984) added yet another study to the literature when they evaluated an industrial fitness program at a regional Prudential Insurance Company office. Voluntary participation in this fitness program netted 1,389 employees. Participants were mostly well educated and held white-collar jobs. Highlights of the results follow.

The group experienced 45.7% reduction in major medical costs in the postentry year, rather than the inflationary increase. There was a reduction of 20.1% in the average number of disability days, and a 31.7% reduction in direct disability dollar costs in the one-year postentry period (p. 809).

One program dealt specifically with weight reduction to help control escalating health care costs. Lockheed Missiles and Space Company sponsored "Take It Off '83" as a retardant to heart attacks. Seidman, Sevelius, and Ewald (1984) examined this program and announced positive findings. This attempt was phase one of a longer range employee

health care program. Of the initial 2,499 participants, 70% completed the program with 90% of those losing weight. Men were more successful (36%) at losing weight than were women (17%). Lockheed believed that the program was effective in that it brought many employees closer to their optimum weight, and had, as a result, more employees with less health risk.

Another successful health promotion program is at Blue Cross and Blue Shield of Indiana (BCBSI). Gibbs, Mulvaney, Henes and Reed (1985) added the following regarding their accomplishments:

Disability days declined 20% for participants, while the average for all employees at the facility remained at a level that had changed little over a five-year period. Average health insurance payments for participants declined about 40% in constant dollars, while the trend for all employees had been increasing payments over the previous four years (p. 827).

The much acclaimed Health Management Program at Kimberly-Clark has widespread participation (Dedmon et al., 1982, p. 25) and has accumulated successful results. Kimberly-Clark's positive results are borne out by the fact that 55% of their employees exercise regularly (Smoczyk and Dedmon, 1985, p. 575). Further investigation is continuing,

but Smoczyk and Dedmon (1985) contend that current evaluation indicates probable, "positive effects on health-care cost containment, absenteeism, productivity, and recruitment" (p. 575).

Two other large firms have reported positive findings from their wellness programs ("Business is Bullish on Wellness", 1983). Participants in Johnson & Johnson's "Live for Life" produced 9% fewer sick days than in the year before they started the program, while in the same period non-participants' sick days increased by 13%. Control Data Corporation (CDC) sponsors an exercise program called "Stay Well", whose participants indicated a 36% reduction in health care costs compared to those who did not exercise.

Wellness programs at the worksite continue to grow in numbers and sophistication. The reasons for this escalation are not always clear nor well-understood by corporate leaders, though rewards for both the corporations and individuals seem clear. Fox, Goldbeck and Spies explain the growth in the following manner:

The expansion of worksite wellness programs has not been based on data that demonstrates the financial return of the program although some evidence does suggest that this can be one outcome. Rather, the expansion has emanated from the cultural

acceptance of the changing nature of illness, greater understanding of limitations of the medical system, and the awareness that health can be promoted through behavioral and environmental changes (pp. 150-151).

In one of the rare studies conducted within the confines of higher education, Ward Tishler (1984) told of the following program on the campus of the University of Montevallo covering a period of 28 weeks. Tishler presented the findings of this research to the annual convention of the American Alliance for Health, Physical Education, Recreation and Dance (April, 1984). Montevallo's program goals were to ascertain if the health of professionals enrolled in the program could be improved. Results indicated significant improvement on situps, the 12 minute run, flexibility, and maximum oxygen capacity. University of Montevallo participants revealed an "improved sense of personal esteem that was conveyed in positive behavior throughout their personal, professional and social life" (p. 12).

## CHAPTER 3

## PROCEDURES AND METHODOLOGY

Introduction

The purpose of this study was to examine the effectiveness of a wellness program for full-time faculty and administrators at Montana State University who had participated for a minimum of three quarters since its beginning in the spring of 1985. The wellness program was examined to determine if those employees who participated in the program showed a lowering of their appraised age, whether they had less absenteeism than their non-participating counterparts, and if health care claim costs for participants was lower than for non-participants. The following behavioral items were also evaluated: tobacco usage, alcohol consumption, level of physical activity, and the use of seat belts. These self-reported data from both participants and non-participants were collected from the Health Risk Appraisal.

This chapter will first describe the population and the method used to select the research sample from that population. Methods of collecting the data will then be described. The hypotheses will be given along with the methods for analyzing the collected data.

#### Population Description and Sampling Procedures

The population consisted of all full-time on-campus faculty and administrators of Montana State University (MSU), located in Bozeman, Montana. This small town (approximately 29,000) is in southwestern Montana about 90 miles north of Yellowstone Park. MSU, which opened in 1893, is the land-grant institution for Montana. The 10,000+ students come mainly from Montana, yet the faculty are from all parts of the United States and several foreign countries. Approximately 800 male and female faculty and administrators are employed on-campus at Montana State University.

The participants who composed the experimental group were limited to those full-time on campus faculty and administrators who elected to participate in the wellness program, which is open to all employees. In order to be considered a

participant in the wellness program for purposes of this study, an individual must have participated in a minimum of one wellness activity class during a minimum of three quarters between the beginning of autumn quarter 1985 and the end of autumn quarter 1986. This means that to be considered a participant, an individual would have completed three activity classes.

The members of the control group were selected from faculty and administrators who had not participated in any wellness activity classes. They were matched to the individuals who constituted the experimental group on the basis of gender, age, and level of physical activity. To be matched on age the potential member of the control group must have been within five years on either side of the actual age of the person he or she was being matched to in the experimental group. If a member of the experimental group was a 37 year old female, then in order to create a match the control group member must have been a female between the ages of 32 and 42.

#### Method of Collecting Data

##### Health Risk Appraisal

Each individual, whether in the experimental

or control group, completed the "Health Risk Appraisal." This instrument, developed and tested at the University of Minnesota, was validated against the Centers for Disease Control appraisal (Ellis and Raines, 1983).

All wellness activity class participants who met the criteria to be considered members of the experimental group were sent a Health Risk Appraisal during Spring Quarter 1987 and asked to complete the instrument. In addition, all other members of the faculty and administration who had not participated in any wellness activity classes were sent the Health Risk Appraisal as well. Dr. Gary Evans, Director of the MSU Employee Wellness Program, introduced the Health Risk Appraisal with a cover letter sent from the Wellness Office through the campus mail. Responses were returned to that office. All Health Risk Appraisals were administered during the same time period, Spring Quarter 1987.

#### Absenteeism

The number of sick days used by participants in both the experimental and control groups were obtained from the Office of Personnel Services on the MSU campus. These individual totals included fiscal year 1986 (July 1985-June 1986) and the first six

months of fiscal year 1987 and were rounded to the nearest half-day for members of each group. These figures were initially reported to each individual's supervisor and that official verified the accuracy of the sick days used prior to when the time card was forwarded to the Office of Personnel Services for tabulation.

#### Health Care Costs

Data were collected from MSU's health insurance company, United of Omaha, regarding the dollars reimbursed for health care for each Montana State University employee who was investigated in this study. A list of all MSU employees was sent to the researcher. These data reported the total dollar amount per employee (not family) of health care claims submitted. The time period used for this aspect was from January 1, 1986 through December 31, 1986.

#### Reporting the Data

Following the completion of the Health Risk Appraisal for each member of both samples, the data from the instrument were input into a computer and an appraised age was calculated for each person.

One of the questions on the Health Risk

Appraisal dealt with the level of physical activity that a person enjoyed. There were only three categories that an individual could choose. They were: Level 1 - little or no physical activity, Level 2 - occasional physical activity, and Level 3 - regular physical activity at least 3 times per week. Each individual answered this question about the level of physical activity in one of these three categories. Physical activity was defined by the Health Risk Appraisal as "work and leisure activities that require sustained physical exertion such as walking briskly, running, lifting and carrying." For purposes of this study, Levels 1 and 2 were collapsed into one category.

Whether tobacco was used by the individuals surveyed was also evaluated. Respondents again had a forced choice answer. They were asked whether they were (1) a smoker, (2) an ex-smoker, or (3) never smoked.

Alcohol use was another variable that was tested. Each participant in the study was again forced to choose the answer that best described the amount of alcohol that the individual consumed. Each respondent answered whether they were a (1) drinker, (2) an ex-drinker, or (3) a non-drinker or drinks

less than one drink per week.

Another lifestyle factor considered dealt with the use of seat belts by participants in the study. The individuals in this case estimated the percent of time that they used seat belts. The possible range of answers to this question for respondents was from 0% to 100%.

The Office of Personnel Services on the Montana State University campus provided the amount of sick leave taken for each individual included in the study. Personnel Services allowed their records to be viewed for the given time period as to the amount of sick leave taken for each individual who was included in either the experimental or control group. Members of the general faculty report sick leave to the nearest half-day for each month of the year. This is a continuous variable, so the exact number of sick days taken was reported to the nearest one-half day.

United of Omaha provided a list of all MSU employees. This list reported the total dollar amount per employee (not family) of health care claims submitted. The time period used for this aspect was again from January 1, 1986 through December 31, 1986.

### Method of Organizing Data

The Statistical Package for the Social Sciences (SPSS<sub>x</sub>, 1975) was utilized for data analysis in this study. Study participants were assigned a number for identification on the computer printout. The independent variables of gender and participation were entered into the computer for statistical analysis. The data collected for the six dependent variables (health age discrepancy, tobacco use, alcohol use, seat belt use, absenteeism and medical claim costs) were analyzed and will be presented in the form of tables in Chapter 4.

### Statistical Hypotheses

The six hypotheses listed below were tested to resolve the problem as stated in the study. Ferguson (1981) stated that it is "common convention to adopt levels of significance of either .05 or .01" (p. 175). For the purpose of this study, the .05 level of significance was adopted by this researcher.

Setting the level of significance at .05 meant that the researcher was taking the chance of being wrong five out of 100 times. It also meant that the researcher was willing to take the chance of rejecting a true null (Type I error) at the .05

level. The researcher did not want to recommend that needless money be poured into the wellness program when, in fact, no significant difference was shown in the variables that were tested. Since this study was exploratory in nature, the .05 level seemed to be the most appropriate. Future researchers in this area may want to increase to .01 the level of significance.

The null hypotheses for this study were:

Hypothesis 1. Ho<sub>1</sub>: There is no interaction between gender and participation in the health age discrepancy.

Ho<sub>2</sub>: There is no difference between males and females in health age discrepancy.

Ho<sub>3</sub>: There is no difference between participants and non-participants in their health age discrepancy.

Hypothesis 2. Ho<sub>1</sub>: A male's use of tobacco is independent of a male's participation in the wellness program.

Ho<sub>2</sub>: A female's use of tobacco is independent of a female's participation in the wellness program.

Hypothesis 3. Ho<sub>1</sub>: A male's use of alcohol is independent of a male's participation in the wellness program.

Ho<sub>2</sub>: A female's use of alcohol is independent of a female's participation in the wellness program.

Hypothesis 4. Ho<sub>1</sub>: There is no interaction between gender and participation in relation to the use of seat belts.

Ho<sub>2</sub>: There is no difference between males and females in relation to the use of seat belts.

Ho<sub>3</sub>: There is no difference between participants and non-participants in relation to the use of seat belts.

Hypothesis 5. Ho<sub>1</sub>: There is no interaction between gender and participation in relation to absenteeism.

Ho<sub>2</sub>: There is no difference between males and females in relation to absenteeism.

Ho<sub>3</sub>: There is no difference between participants and non-participants in relation to absenteeism.

Hypothesis 6. Ho<sub>1</sub>: There is no interaction between gender and participation in relation to health care claim costs.

Ho<sub>2</sub>: There is no difference between males and females in relation to health care claim costs.

Ho<sub>3</sub>: There is no difference between participants and non-participants in relation to health care claim costs.

Statistical Procedures

Two different statistical procedures were used to test the hypotheses. A two-way analysis of variance was used to analyze the data to test hypotheses 1, 4, 5, and 6. Participation in the wellness program and gender were used as the independent variables to individually test the interaction effect on the dependent variables of "health age discrepancy," seat belt usage, sick days, and medical claim costs. According to Ferguson (1981), a two-way analysis of variance is an appropriate procedure when the relationship between one dependent variable and two or more independent variables is being tested.

In order to test hypotheses 2 and 3, a non-parametric statistic was used. Borg and Gall (1971) state that when scores are "in the form of categories or ranks, one of the non-parametric statistics should be used" (p. 311). In these hypotheses the data were organized into categories and therefore this researcher used the chi-square test of independence since the data used in hypotheses 2 and 3 were ordinal. These tests included tobacco and alcohol use.

Precautions for Accuracy

Precautions taken for accuracy included the following:

1. the data were entered into the Montana State University Computer System through a terminal, under the direction of Dr. Donald Robson, Head, Department of Education.
2. accuracy of the information entered was verified independently by Dr. Robson and the researcher.
3. the SPSS<sub>x</sub> package was employed for the two-way analysis of variance and the chi-square test of independence by Dr. Donald Robson at the Montana State University Computer Center.
4. all individuals not meeting the criteria stated were eliminated from the study.

## CHAPTER 4

## ANALYSIS OF DATA

The results of the data analyses used for the major and secondary problems of this study are contained in this chapter. The analysis of the data is presented by testing each hypothesis.

The problem of this study was to determine the effectiveness of a wellness program for full-time faculty and administrators at Montana State University. Those included in the study had participated in the wellness program for a minimum of three quarters since the program began in Spring Quarter, 1985.

A total of six hypotheses were formulated to study the major problem. The results of the tests of these hypotheses, all tested at the .05 level of significance, will be reviewed in this chapter. The results of each hypothesis are presented and then analyzed separately.

A total of 78 individuals were examined in this study. Of the 78, 32 were female and 46 were male. For the females, 16 were in the experimental

group and 16 were in the control group. Within the male sample, 23 were control and 23 were experimental.

### Hypothesis One

Three nulls were tested under hypothesis one. They were: (1) that there was no interaction between gender and participation in the wellness program for health age discrepancy, (2) that there was no difference between males and females in health age discrepancy, and (3) that there was no difference between participants and non-participants in their health age discrepancy.

Table 2. Table of Means for Health Age Discrepancy\* According to Gender and Participation.

GENDER	PARTICIPATION	
	Wellness Participants	Non-participants
Males	4.47	4.02
Females	2.05	2.32

\*Health Age Discrepancy reported as a mean number representing the difference (positive or negative) between actual chronological age and "appraised age" or wellness age. (The larger the number, the greater the degree of wellness.)

Table 3. Two-way ANOVA Table of Health Age Discrepancy According to Gender and Participation.

Source of Variation	Sum of Squares	D.F.	Mean Square	F	F Probability
Main Effects	124.127	2	62.064	4.566	.012
Gender	123.061	1	123.061	9.053	.003
Group	1.067	1	1.067	.078	.780
Two-way Interactions					
Gender by Group	3.786	1	3.786	.278	.599

Table 2 shows that males, both participants and non-participants, had a higher mean for health age discrepancy than did females for both groups. Inspection of the data in Table 3 reveals that there was a main effect, significant at the .05 level. Males, both participants and non-participants, had a larger, positive health age discrepancy than did females of both groups. No interaction existed between health age discrepancy and gender and participation.

Results of Analysis

Ho <sub>1</sub> There was no interaction between gender and participation in health age discrepancy.	Retain
Ho <sub>2</sub> There was no difference between males and females in health age discrepancy.	Reject
Ho <sub>3</sub> There was no difference between participants and non-participants in their health age discrepancy.	Retain

Hypothesis Two

Two nulls were tested under hypothesis two. They stated (1) that an male's use of tobacco was independent of participation in the wellness program, and (2) that a female's use of tobacco was also independent of participation in the wellness program.

Table 4. Chi-Square Test of Independence Analysis for Males with Tobacco Use and Participation.

Tobacco Use	Participant	Non-participant
Often		
Expected	3.5	3.5
Observed	4	3
Occasionally		
Expected	11.5	11.5
Observed	11	12
Never		
Expected	24	24
Observed	24	24

D.F. = 2

Chi Square = .18634

Sig. = .9110

Table 5. Chi-Square Test of Independence Analysis for Females with Tobacco Use and Participation.

Tobacco Use	Participant	Non-participant
Occasionally/often		
Expected	9	9
Observed	12	6
Never		
Expected	14	14
Observed	11	17

D.F. = 1

Chi Square = 2.28175

Sig. = .1309

Table 5 only has four cells. When the tabulations were originally run, only one individual was included in the participant column and one in the non-participant column for "often" use of tobacco. So, "often" and "occasionally" were collapsed into one category. The data in Tables 4 and 5 indicate, at the .05 level of significance, that the characteristic of tobacco use was independent of participation for both males and females.

#### Results of Analysis

H<sub>01</sub>

A male's use of tobacco is independent of a male's participation in the wellness program.

Retain

Ho<sub>2</sub>

A female's use of tobacco is independent of a female's participation in the wellness program.

Retain

Hypothesis Three

Two nulls were tested under hypothesis three. They stated (1) that a male's use of alcohol was independent of participation in the wellness program, and (2) that a female's use of alcohol was independent of participation in the wellness program.

Table 6. Chi-Square Test of Independence Analysis for Males with Alcohol Use and Participation.

Alcohol Use	Participant	Non-participant
Occasionally/often		
Expected	28	28
Observed	31	25
Never		
Expected	11	11
Observed	8	14

D.F. = 1

Chi Square = 1.58279

Sig. = .2084

Table 7. Chi-Square Test of Independence Analysis for Females with Alcohol Use and Participation.

Alcohol Use	Participant	Non-participant
Occasionally/often		
Expected	13	13
Observed	14	12
Never		
Expected	10	10
Observed	9	11

D.F. = 1

Chi Square = .08846

Sig. = .7661

Tables 6 and 7 have only four cells because, again, the data only showed two individuals in the non-participant column for "occasional" use of alcohol. They were then collapsed within the "often" category. The data in Tables 6 and 7 reveal at the .05 level of significance that the variable of alcohol use was independent of participation for both males and females.

#### Results of Analysis

Ho<sub>1</sub>

A male's use of alcohol is independent of a male's participation in the wellness program.

Retain

Ho<sub>2</sub>

A female's use of alcohol is independent of a female's participation in the wellness program.

Retain

Hypothesis Four

Three nulls were tested under hypothesis four. They stated (1) that there was no interaction between gender and participation in relation to the use of seat belts, (2) that there was no difference between males and females in relation to seat belt use, and (3) that there was no difference between participants and non-participants in relation to seat belt use.

Table 8. Table of Means for Seat Belt Use\* According to Gender and Participation.

GENDER	PARTICIPATION	
	Wellness Participants	Non-participants
Males	73.38	75.37
Females	90.00	73.86

\*Seat belt use expressed as a percentage of time seat belts are used.

Table 9. Two-way ANOVA Table of Seat Belt Use According to Gender and Participation.

Source of Variation	Sum of Squares	D.F.	Mean Square	F	F Probability
Main Effects	2370.864	2	1185.432	1.566	.213
Gender	1640.731	1	1640.731	2.167	.144
Group	692.729	1	692.729	.915	.341
Two-way Interactions					
Gender by Group	2309.367	1	2309.367	3.051	.083

Table 9 shows no main effects, but, the variability of responses was great and that could affect the error term. Since the variability was so large, four one-way analyses of variance were performed. These one-way analyses were (1) wellness participation according to seat belt use and gender, (2) non-participation in the wellness program according to seat belt use and gender, (3) males according to seat belt use and participation, and (4) females according to seat belt use and participation. These one-way analyses all refer back to Table 8 (Table of Means). The results of the one way analyses of variances are reported in Tables 10-13.

Table 10. One-way ANOVA Table of Wellness Participation According to Seat Belt Use and Gender.

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	1	3918.5473	3918.5473	5.4434	.0231
Within Groups	58	41752.7027	719.8742		
Total	59	45671.2500			

There was a significant difference at the .05 level of significance between male and female wellness participants regarding seat belt use, with females using seat belts significantly more frequently than male wellness participants.

Table 11. One-way ANOVA Table of Wellness Non-Participation According to Seat Belt Use and Gender.

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	1	31.5503	31.5503	.0397	.8427
Within Groups	58	46059.4330	794.1282		
Total	59	46090.9833			

The analysis indicated no significance between non-participants of the wellness program according to gender.

Table 12. One-way ANOVA Table for Males According to Seat Belt Use and Participation.

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	1	74.2419	74.2419	.0802	.7778
Within Groups	73	67573.5448	925.6650		
Total	74	67467.7867			

Table 12 disclosed no significant difference between male participants and non-participants in the percentage of seat belt use.

Table 13. One-way ANOVA Table for Females According to Seat Belt Use and Participation.

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	1	2927.8535	2927.8535	6.2207	.0165
Within Groups	43	20238.5909	470.6649		
Total	44	23166.4444			

Table 13 describes a significant difference, at the .05 level, between female wellness participants and females who were not wellness participants in terms of the percentage of seat belt use. Females in the wellness program used seat belts significantly more often than did the females who had not participated in the wellness program. Indeed,

female wellness participants use seat belts significantly more often than any other gender or participant group in the study.

#### Results of Analysis

Ho<sub>1</sub>  
There was no interaction between gender and participation in relation to seat belt use. Retain

Ho<sub>2</sub>  
There was no difference between males and females in relation to seat belt use. Retain

Ho<sub>3</sub>  
There was no difference between participants and non-participants in relation to seat belt use. Retain

#### Hypothesis Five

Three nulls were tested under hypothesis five. They stated (1) that there was no interaction between gender and participation in relation to absenteeism, (2) that there was no difference between males and females in relation to absenteeism, and (3) that there was no difference between participants and non-participants in relation to absenteeism.

Table 14. Table of Means for Absenteeism\* According to Gender and Participation.

GENDER	PARTICIPATION	
	Wellness Participants	Non-participants
Males	1.13	7.38
Females	3.23	3.23

\*Absenteeism expressed as the mean number of days that an individual took sick leave.

Table 15. Two-way ANOVA Table of Absenteeism According to Gender and Participation.

Source of Variation	Sum of Squares	D.F.	Mean Square	F	F Probability
Main Effects	108.971	2	54.485	.608	.549
Gender	20.210	1	20.210	.226	.637
Group	77.936	1	77.936	.870	.356
Two-way Interactions					
Gender by Group	109.564	1	109.564	1.222	.275

Table 15 again shows no main effects and no interaction. However, Table 14 showed a very large mean for one of the groups. The data were examined to see if all assumptions were met for

using a two-way analysis of variance. It was discovered that there were a total of two outliers (extreme cases) that could strongly affect the conclusions. One male in the non-participant category had taken 65 sick leave days, another 11.5. All the remaining sick leave days were below ten. These outliers (and their match) were removed and the data analyzed again. The results of this analysis are shown in Tables 16 and 17. Those tables follow the results of analysis for Hypothesis six.

#### Results of Analysis

Ho <sub>1</sub> There was no interaction between gender and participation in relation to absenteeism.	Retain
Ho <sub>2</sub> There was no difference between males and females in relation to absenteeism.	Retain
Ho <sub>3</sub> There was no difference between participants and non-participants in relation to absenteeism.	Retain

Table 16. Table of Means for Absenteeism\* According to Gender and Participation Without Outliers.

GENDER	PARTICIPATION	
	Wellness Participants	Non-participants
Males	1.13	2.14
Females	3.23	3.23

\*Absenteeism expressed as the mean number of days that an individual took sick leave.

Table 17. Two-way ANOVA Table of Absenteeism According to Gender and Participation Without Outliers.

Source of Variation	Sum of Squares	D.F.	Mean Square	F	F Probability
Main Effects	27.720	2	13.860	2.517	.093
Gender	26.925	1	26.925	4.889	.033
Group	1.922	1	1.922	.349	.558
Two-way Interactions					
Gender by Group	2.816	1	2.816	.511	.479

Once the outliers were removed significance, at the .05 level, was shown for males. Males, in

both the participant and non-participant groups had fewer sick days than did the females of both groups.

Hypothesis Six

Three nulls were tested under hypothesis six. They stated (1) that there was no interaction between gender and participation in relation to health care claim costs, (2) that there was no difference between males and females in relation to health care claim costs, and (3) that there was no difference between participants and non-participants in relation to health care claim costs.

Table 18. Table of Means for Health Care Claim Costs (in dollars) According to Gender and Participation.

GENDER	PARTICIPATION	
	Wellness Participants	Non-participants
Males	566.40	2507.50
Females	3198.21	1418.67

Table 19. Two-way ANOVA Table of Health Care Claim Costs According to Gender and Participation.

Source of Variation	Sum of Squares	D.F.	Mean Square	F	F Probability
Main Effects	15235701.917	2	7617850.959	.221	.803
Gender	12399123.182	1	12399123.182	.359	.551
Group	2979718.476	1	2979718.476	.086	.770
Two-way Interactions					
Gender by Group	53178218.197	1	53178218.197	1.540	.219

There were no main effects nor interaction indicated in Table 19. Again, the data were examined for outliers and two were found. In this case one non-participant male had \$34,098 worth of claims and a female participant had \$31,902 in health claims. All of the other claims were below \$6,200. These outliers were removed and the data analyzed again. The outcomes are shown following the results of analysis for Hypothesis six.

Results of AnalysisHo<sub>1</sub>

There was no interaction between  
gender and participation in  
relation to health care claim costs.

Retain

Ho<sub>2</sub>

There was no difference between  
males and females in relation to  
health care claim costs.

Retain

Ho<sub>3</sub>

There was no difference between  
participants and non-participants  
in relation to health care claim costs.

Retain

Table 20. Table of Means for Health Care Claim Costs  
(in dollars) According to Gender and Participation  
Without Outliers.

GENDER	PARTICIPATION	
	Wellness Participants	Non-participants
Males	392.06	308.31
Females	3431.00	1520.91

Table 21. Two-way ANOVA Table of Health Care Claim Costs According to Gender and Participation Without Outliers.

Source of Variation	Sum of Squares	D.F.	Mean Square	F	F Probability
Main Effects	78403835.377	2	39201917.688	2.208	.120
Gender	67628176.140	1	67628176.140	3.809	.056
Group	10130738.186	1	10130738.186	.571	.453
Two-way Interactions					
Gender by Group	11667330.246	1	11667330.246	.657	.421

No significant outcomes resulted from analyzing the data with the outliers removed. Although males, in both in the participant and non-participant groups, had lower health care costs than females, the difference was not statistically significant.

The final chapter of this paper will present the summary, conclusions, and recommendations of this study. The data presented in this chapter will serve as the foundation upon which the conclusions and recommendations will be drawn.

## CHAPTER 5

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is to recapitulate the prominent points from previous chapters and to analyze the significance of the data. There are three sections to this chapter. In the first section, a summary of the study is presented. In the second section, conclusions are drawn. In the third section, recommendations are presented.

Summary

The problem of this study was to determine whether participation in the employee wellness program had an effect on the faculty and administration at Montana State University in contrast to those employees who did not participate. Several studies, mainly from the corporate sector of American business, have indicated that participation in wellness programs can reduce absenteeism, lower health care cost claims, and improve the general health of the individual participants in such programs. Although studies have taken place in the

corporate sector, virtually no research has been conducted in educational settings in America.

Researchers in the wellness field have consistently declared the need for complete, well documented and well conducted studies (Fielding, 1982; Hoffman & Hobson, 1984; Metcalfe, 1985). This research attempted to fill that need with a focus in the educational arena.

Three basic questions were addressed:

1. Could the health age discrepancy of participants in the wellness program, as measured by the Health Risk Appraisal be affected by participation in the wellness program?
2. Do participants have less absenteeism than non-participants?
3. Are health care claim costs for participants lower than for non-participants?

More specifically, participants and non-participants were compared in the following areas:

- I. Lifestyle factors
  - A. Appraised age
  - B. Tobacco usage
  - C. Alcohol usage
  - D. Seat belt usage

## II. Economic criteria

- A. Absenteeism
- B. Medical claim costs

In general, the question asked was "Is the program effective for controlling rising health care costs and can the program improve the general health of MSU employees?"

### Findings and Conclusions

The results of this study allowed the researcher to list the following descriptive findings:

1. Males, in both the wellness participant category and the non-participant category, possessed a higher, positive health age discrepancy than did females in both categories.
2. The use of tobacco was not a significant factor when comparing wellness participants and non-participants of either gender.
3. The use of alcohol was not a consideration when comparing wellness participants and non-participants of either gender.
4. Female wellness participants used their seat belts significantly more often than did their non-wellness female counterparts.

5. In addition, female wellness participants used their seat belts significantly more often than did male wellness participants and male non-participants.

6. Participation did not affect the rate of absenteeism for either males or females.

7. Participation in the wellness program did not influence the health care claim costs for males or females.

These findings indicate the following conclusions: (1) the wellness program does not act to reduce health care costs for Montana State University wellness participants, (2) wellness participants do not necessarily lead healthier lifestyles, and (3) in addition, the general health of MSU employees was not affected by participation in the wellness program.

This study implies that health care containment costs are not good reasons, especially at the initial or start-up phase, for conducting wellness programs. These results contradict studies cited earlier in the study that showed a reduction in health care costs as well as absenteeism. There are suggestions throughout the literature that, possibly, the greatest benefit of wellness programs are the

intrinsic rewards of greater self-esteem and self-satisfaction that employees gain. It is worth quoting Fox, Goldbeck and Spies regarding the growth and success of wellness programs when they stated that

...the expansion has emanated from the cultural acceptance of the changing nature of illness, greater understanding of limitations of the medical system, and the awareness that health can be promoted through behavioral and environmental changes (pp. 150-151).

This study indicates that there is much more research that might be undertaken in the future. The next section presents ideas for further research in the area of employee wellness programs on campuses of higher education institutions.

#### Recommendations

This study was the first of its kind in higher education situations. Other quantitative research needs to be performed to determine the effectiveness of each of the various associated factors. In addition, other questions of a qualitative nature should also be investigated. Based upon the findings and conclusions of this study, the following recommendations surface as proper for further investigation.

1. This study should be replicated. This could take place in other institutions of different sizes as well as in a variety of geographical locations. An urban institutional setting(s) would be ideal. Also, consortia could be tapped for participation. This researcher believes that the general fitness mania in Bozeman and MSU in particular may be so elevated that those people not participating in formal programs may be doing many fitness activities on their own. The reasons that participants gave for joining the wellness programs need to be explored. In addition, what were their expectations of the program prior to joining? How do these factors compare to program expectations gathered from other regions of the country?

2. It would be useful in future studies on other campuses to gather baseline data at the outset.

3. Further investigation would be appropriate in regard to females and seat belt use. How many are mothers? Why is there such a difference between females in the wellness program in seat belt use and non-participant females?

4. Data should be collected on female stress level (especially mothers) and their need for formal programs in contrast to working fathers.

5. The types of wellness activities and success (health age discrepancy, absenteeism, health care cost claims, tobacco use, alcohol use, and seat belt use) should also be correlated.

6. Health care claim costs should be analyzed according to type of injury, illness, or accident. Some claims submitted from accidents or injuries may not be attributable to either level of health or lifestyle habits. As a corollary, the idea of sick days or sick leave may warrant careful definition since employers often seem to apply the term to a range of situations, for example, from attending a family member's funeral to christening a new baby in the family.

7. Researching the relative attractiveness of a wellness program in luring new faculty members to Montana State University would be useful. Job satisfaction and job dissatisfaction are two different constructors. Relating wellness to job satisfaction could be an informative study.

8. An examination of the leading causes of death nationally should be compared to MSU faculty. In addition, the incidence of certain diseases should be measured against the population as a whole.

9. An examination of the leading causes of death nationally could be compared to faculty members in all land-grant institutions in the United States.

10. A study of the morale of employees, wellness participants vs. non-participants should be done. What factors surrounding morale are important for employees, as they relate to wellness.

11. These data should be saved and the study be replicated on the MSU campus in another three or five years.

12. Psychological factors were not examined in this study. What reasons people give for starting into wellness programs need to be explored. What are the psychological considerations that influence the success of wellness participants?

REFERENCES CITED

## REFERENCES CITED

- Ardell, Don B. The History and Future of Wellness. Diablo Press, 1984.
- Baun, W. B. and Landgreen, M. A. Tenneco Health and Fitness: A Corporate Program Committed to Evaluation. Journal of Physical Education, and Dance. 1983,
- Beery, William; Schoenbach, Victor J.; Wagner, Edward H.; Graham, Robin M.; Karon, John M.; Pezzullo, Susan. Description, Analysis and Assessment of Health Hazard/Health Risk Appraisal Programs. National Center for Health Services Research. March 13, 1981.
- Bernacki, E. J. and Baun, W. B. The Relationship of Job Performance to Exercise Adherence in a Corporate Fitness Program. Journal of Occupational Medicine. 1984, 26, 529-531.
- Borg, Walter R. and Gall, Meredith D. Educational Research: An Introduction. New York: David McKay Company, Inc., 1974.
- Bowne, D. W.; Russell, M. L.; Morgan, J. L.; Optenber, S. A.; and Clarke, A. E. Reduced Disability and Health Care Costs in an Industrial Fitness Program. Journal of Occupational Medicine. 1984, 26, 809-816.
- Business is Bullish on Wellness. Executive Fitness Newsletter. 1983, p. 1.
- Carnegie Foundation. Three Thousand Futures: The Next Twenty Years for Higher Education. Jossey-Bass Publishers, 1980.
- Cohen, W. S. Health Promotion in the Workplace: A Prescription for Good Health. American Psychologist. 1985, pp. 213-216.
- Cooper, G. L., and Melhuish, M. B. Executive Stress and Health: Differences Between Men and Women. Journal of Occupational Medicine. 1984, 26, 99-104.

- Cox, M.; Shepard, R. J.; and Corey, P. Influence of an Employee Fitness Programme Upon Fitness, Productivity and Absenteeism. Ergonomics. (Oct. 1981): 795-806.
- Dedmon, Robert E.; Bigalke, Lucille L.; Smoczyk, Connie M. Kimberly-Clark's Health Management Program. Occupational Health Nursing. (June 1982): 25-27, 46.
- Dunn, H. L. High Level Wellness: An Alternative to Doctors, Drugs, and Disease. Arlington, Va.: R. W. Beatty.
- Ellis, Lynda B. and Raines, John R. Health Risk Appraisal: A Tool for Health Education. Health Education/Microcomputers. (October, 1983): 30-34.
- Ferguson, George A. Statistical Analysis in Psychology and Education. McGraw-Hill Book Company, 1981.
- Feuer, D. Wellness Programs: How do They Shape up? Training: The Magazine of Human Resources Development. (Apr. 1985): 25-38.
- Fielding, J. E. Effectiveness of Employee Health Improvement Programs. Journal of Occupational Medicine. 1982, 24, 907-916.
- Fox, P. D.; Goldbeck, W. B.; & Spies, J. J. (n.d.). Health Care Costs Management: Private Sector Initiatives.
- Gibbs, J. O.; Mulvaney, D.; Henes, C.; and Reed, R. W. Work-site Health Promotion: Five-year Trend in Employee Health Care Costs. Journal of Occupational Medicine. 1985, 27, 826-830.
- Goetz, Axel A.; Duff, Jean F.; Bernstein, James E. Health Risk Appraisal: The Estimation of Risk. Public Health Reports. (March-April 1980): 119-126.
- Healthy Montanans: 1990 Perspectives. Montana Department of Health and Environmental Sciences. Helena, Montana, 1984.

- Haskell, W. L. and Blair, S. N. The Physical Activity Component of Health Promotion in Occupational Settings. Public Health Reports. 1980, 95, 109-118.
- Hettler, B. Lifestyle assessment questionnaire, 2nd ed. University of Wisconsin at Stevens Point, Institute for Lifestyle Improvement, 1980.
- Higgins, C. W. and Philips, B. U. How Company-sponsored Fitness Programs Keep Employees on the Job. Management Review. 1979, 68, 53-55.
- Hoffman, Jr., J. J. and Hobson, C. J. Physical Fitness and Employee Effectiveness. Personnel Administrator. (Apr. 1984): 101-113.
- Kirkpatrick, S. L. Leaders in Wellness. Occupational Health Nursing. (Sept. 1985): 450-452.
- LaRosa, J. H.; Haines, C. M.; and Kiefhaber, A. Cost Analysis and Workplace Health Promotion Programs. Occupational Health Nursing. (May 1985): 234-236, 262.
- McGinnis, J. M. Worksite Health Promotion: Examples of Programs That Work. U. S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (n. d.).
- McMillan, Liz. Finding 'Wellness' Programs Cut Absenteeism, Boost Productivity and Morale of Their Staff Members. The Chronicle of Higher Education. (February 19, 1986): 21-22.
- Metcalfe, L. L. Eight Factors for a Successful Employee Health and Fitness Program. Wellness Management. 1985, 1, 5.
- National Cash Register Co.'s Pioneer Physical Fitness Program. Dun's Review. (Nov. 1980): 155-156, 158.
- Nie, Norman; Hull, C. Hadlai; Jenkins, Jean; Steinbrenner, Karin and Bent, Dale. Statistical Package for the Social Sciences. McGraw Hill Book Company, 1975.

O'Donnell, M. P. and Ainsworth, T. Health Promotion in the Workplace. New York: John Wiley and Sons, 1984.

Pauly, J. T.; Palmer, J. A.; Wright, C. C.; and Pfeiffer, G. J. The Effect of a 14-week Employee Fitness Program on Selected Physiological and Psychological Parameters. Journal of Occupational Medicine. 1982, 24, 457-462.

Pelletier, K. R. Holistic Medicine: From Stress to Optimum Health. New York: Delacorte Press, 1979.

The Health Consequences of Smoking - 1983.  
Rockville, Maryland: Public Health Service.

Rhodes, E. C.; and Dunwoody, D. Physiological and Attitudinal Changes in Those Involved in an Employee Fitness Program. Canadian Journal of Public Health. 1980, 71, 331-336.

Smoczyk, C. M. and Dedmon, R. E. Health Management Program. American Behavioral Scientist. (Mar./Apr. 1985): 559-576.

Seidman, L. S.; Sevelius, G. S.; and Ewald, P. A. Cost-effective Weight Loss Program at the Worksite. Journal of Occupational Medicine. 1984, 26, 725-730.

Thar, W. (Ed.). Health Care Cost Containment: A Preventive Approach. State of Michigan Senate, Prevention Subcommittee of the "Ad Hoc Medical and Health Provider Advisory Committee."  
Lansing, Michigan: State of Michigan, 1984.

Thoreson, R. W. The Professor at Risk: Alcohol Abuse in Academe. The Journal of Higher Education. 1984, 55, 56-72.

The Condition of Education. U. S. Department of Education, National Center for Education Statistics, 1984.

Tishler, J. W. A Wellness Program for University Faculty and Staff. Paper presented at the Annual Convention of the American Alliance for Health, Physical Education, Recreation and Dance, Anaheim, CA. (ERIC Document Reproduction Service No. ED 246 013).

Udeleff, M. Consultant and Client: Fitting for Fitness. Corporate Fitness and Recreation. (Feb./Mar. 1985): 35-39.

Weisensee, M. G. and Ward, B. Evaluation of Health Promotion. Occupational Health Nursing. (Jan. 1985): 9-14.

Yeater, D. C. Health Care Cost Management Update. Occupational Health Nursing. (Dec. 1985): 595-599.

APPENDICES

APPENDIX A  
GOALS OF THE MSU WELLNESS PROGRAM

## Goals for the MSU Wellness Program

1984-85

Objectives for 1984-85:

1. Health care cost containment for employees.
2. Stimulate employees' initiation into a personal wellness program and educate them on the how and why of fitness.
  - a. Lifestyle risk appraisal
  - b. Physical exercise and exercise prescription
  - c. Nutritional counseling
3. Improve work attendance through reduction of general illness incidents.
4. Provide a safe but sustained in-house fitness program.
5. Develop a consciousness within employees of taking care of themselves.
6. Develop a consciousness within employees that the university system cares about them.

Short Term Goals for the next year will be to complete a detailed and thorough Needs Assessment. This should be completed by questionnaire during Fall Quarter 1985. Other short term goals include: Office reorganization for program director and secretary;

selection and hiring of half-time secretary; purchase of IBM (or compatible) computer and software; addition of nutrition, stress management and nursing components; and establishment of program evaluation system.

Long term goals will include the establishment and implementation of data base system to aid in program evaluation. It is hoped that health care cost containment will be achieved for all employees.

Goals of the MSU Wellness Program supplied by the MSU Wellness Office.

APPENDIX B

HEALTH RISK APPRAISAL

# Montana State University

Department of Health, Physical Education and Recreation



We congratulate you for your interest in your health! You and nobody else but you are the one who can have the most impact of maintaining your own health. We feel the Health Risk Appraisal is a tool that can assist you to understand and manage your specific health risks, as well as making daily health decisions. It is designed to show you how your individual lifestyle affects your chances of avoiding the most common causes of death for a person of your age, race and sex. It also shows how much you can improve your chances by changing your harmful habits. The procedure generates a probability statement, not a diagnosis. IMPORTANT: To assure protection of your privacy, do NOT put your name on this form.



PARTICIPANT NUMBER \_\_\_\_\_ 1-6

PLEASE ENTER YOUR ANSWERS IN THE EMPTY BOXES (use numbers only)

1. SEX		<input type="checkbox"/> 1 Male	<input type="checkbox"/> 2 Female	<input type="checkbox"/>	7
2. RACE/ORIGIN		<input type="checkbox"/> 1 White (non-Hispanic origin)	<input type="checkbox"/> 2 Black (non-Hispanic origin)	<input type="checkbox"/> 3 Hispanic	<input type="checkbox"/>
		<input type="checkbox"/> 4 Asian or Pacific Islander	<input type="checkbox"/> 5 American Indian or Alaskan Native	<input type="checkbox"/> 6 Not sure	<input type="checkbox"/>
3. AGE (At Last Birthday)		Years Old			<input type="checkbox"/> <input type="checkbox"/>
4. HEIGHT (Without Shoes)		Example: 5 foot, 7 1/2 inches = <input type="checkbox"/> ' <input type="checkbox"/> <input type="checkbox"/> "		(No Fractions) <input type="checkbox"/> ' <input type="checkbox"/> "	
5. WEIGHT (Without Shoes)		Pounds			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6. TOBACCO		<input type="checkbox"/> 1 Smoker	<input type="checkbox"/> 2 Ex-Smoker	<input type="checkbox"/> 3 Never Smoked	<input type="checkbox"/>
(Smokers and Ex-smokers)		Enter average number smoked per day in the last five years (ex smokers should use the last five years before quitting.)		Cigarettes Per Day	<input type="checkbox"/> <input type="checkbox"/>
				Pipes/Cigars Per Day (Smoke Inhaled)	<input type="checkbox"/> <input type="checkbox"/>
				Pipes/Cigars Per Day (Smoke Not Inhaled)	<input type="checkbox"/> <input type="checkbox"/>
(Ex-smokers only)		Enter Number of Years Stopped Smoking (Note: Enter 1 for less than one year)			<input type="checkbox"/>
7. ALCOHOL		<input type="checkbox"/> 1 Drinker	<input type="checkbox"/> 2 Ex-Drinker (Stopped)	<input type="checkbox"/> 3 Non-Drinker (or drinks less than one drink per week)	<input type="checkbox"/>
		If you drink alcohol, enter the average number of drinks per week:		Bottles of beer per week	<input type="checkbox"/> <input type="checkbox"/>
				Glasses of wine per week	<input type="checkbox"/> <input type="checkbox"/>
				Mixed drinks or shots of liquor per week	<input type="checkbox"/> <input type="checkbox"/>
8. DRUGS/MEDICATION		How often do you use drugs or medication which affect your mood or help you to relax?			<input type="checkbox"/>
		<input type="checkbox"/> 1 Almost every day	<input type="checkbox"/> 2 Sometimes	<input type="checkbox"/> 3 Rarely or Never	<input type="checkbox"/>
9. MILES Per Year as a driver of a motor vehicle and/or passenger of an automobile (10,000 = average)		Thousands of miles			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
10. SEAT BELT USE (percent of time used)		Example: about half the time = <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
11. PHYSICAL ACTIVITY LEVEL		<input type="checkbox"/> 1 Level 1 - little or no physical activity			
		<input type="checkbox"/> 2 Level 2 - occasional physical activity			
		<input type="checkbox"/> 3 Level 3 - regular physical activity at least 3 times per week			
NOTE:		Physical activity includes work and leisure activities that require sustained physical exertion such as walking briskly, running, lifting and carrying.			
12. Did either of your parents die of a heart attack before age 60?		<input type="checkbox"/> 1 Yes, One of them <input type="checkbox"/> 2 Yes, Both of them <input type="checkbox"/> 3 No <input type="checkbox"/> 4 Not sure			<input type="checkbox"/>
13. Did your mother, father, sister or brother have diabetes?		<input type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No <input type="checkbox"/> 3 Not sure			<input type="checkbox"/>
14. Do YOU have diabetes?		<input type="checkbox"/> 1 Yes, not controlled <input type="checkbox"/> 2 Yes, controlled <input type="checkbox"/> 3 No <input type="checkbox"/> 4 Not sure			<input type="checkbox"/>
15. Rectal problems (other than piles or hemorrhoids).		Have you had:			<input type="checkbox"/>
		Rectal Growth?	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No <input type="checkbox"/> 3 Not sure	<input type="checkbox"/>	
		Rectal Bleeding?	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No <input type="checkbox"/> 3 Not sure	<input type="checkbox"/>	
		Annual Rectal Exam?	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No <input type="checkbox"/> 3 Not sure	<input type="checkbox"/>	



MONTANA STATE UNIVERSITY LIBRARIES



3 1762 10021749 4