

DIFFERENCES AMONG SMOKERS, NONSMOKERS AND FORMER SMOKERS  
AN INVESTIGATION OF HEALTH CARE WORKERS

by

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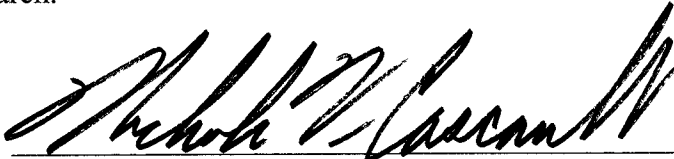
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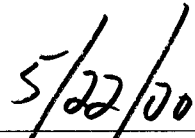
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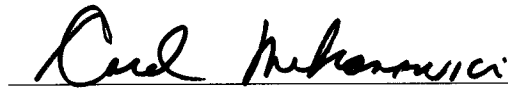
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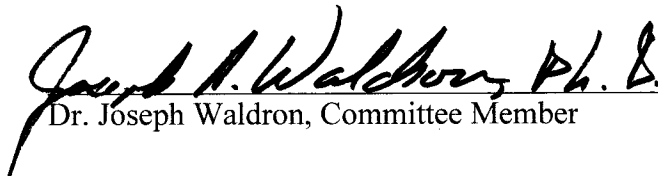
  
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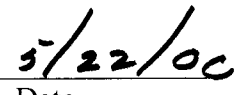
  
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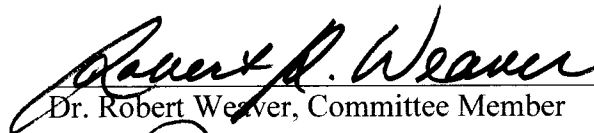
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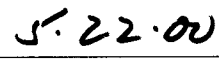
  
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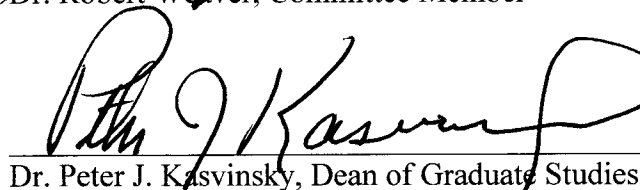
  
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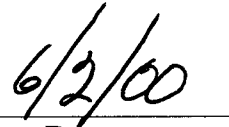
  
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## Abstract

The study consisted of two hundred and six employees from two hospitals. The 38-item questionnaire asked respondents to answer questions regarding behaviors, attitudes, and knowledge concerning smoking cigarettes in general and workplace smoking policies. The percentage of this study that reported they were smokers was 15.5%. A linear regression analysis was performed to assess the predictability of beliefs about smoking in general and workplace smoking policies as a function of actual smoking behavior. Both regression analyses displayed moderate strength  $r^2 = .29$  on general beliefs and knowledge about smoking and  $r^2 = .18$  on workplace smoking policies. ANOVAs were conducted to evaluate differences among smokers, never smokers and former smokers in terms of knowledge and beliefs about smoking in general ( $p < .01$ ) and in attitudes about workplace smoking policies ( $p = .019$ ). Cigarette smokers were more likely to have beliefs that would favor smoking behavior than nonsmokers or former smokers. They also tended to have less knowledge of the effects of smoking. In terms of workplace smoking policy, there were differences between smokers and nonsmokers, however the differences were not as great as they were in terms of general knowledge and beliefs.

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# CHAPTER I

## INTRODUCTION

Cigarette smoking is a major health problem for our nation. It is the leading preventable cause of disease and death in the United States. Smoking prevalence is significantly above the 15 percent that Healthy People 2000 objectives had set forth. In the United States, 48 million adults smoke which is approximately 25% of the adult population (American Lung Association, 1999).

Smoking occurs in both genders with 25 million men and 23 million women smoking on a daily basis. Education is a good predictor of smoking behavior demonstrating that smoking rates are highest among those individuals who have 9-11 years of education. Poverty is a second predictor as people who are at or below the poverty level have higher smoking rates. Smoking causes both health and economic consequences as 90% of all lung cancer can be attributed to smoking and \$2 for every pack of cigarettes bought goes to the medical expenditures associated with that pack.

### **Purpose of the Study**

The purpose of this study was to measure smoking behavior among a working population in a healthcare setting in Mahoning and Trumbull Counties in Northeast Ohio. Those aspects would include knowledge, attitudes, and behaviors associated with cigarette smoking in general and in the workplace. The relationship of demographic factors such as age, gender, race, and level of education will also be examined to look for trends as they relate differences in beliefs, behaviors or knowledge.



### **Hypotheses of the Study**

Hypothesis 1. There are significant differences among smokers, nonsmokers, and former smokers in terms of health beliefs about smoking.

Hypothesis 2. There are significant differences between smokers, nonsmokers, and former smokers in terms of attitudes toward workplace smoking policies

### **Delimitations (parameters of study)**

1. Geographical – The participants work in either Mahoning or Trumbull Counties of Northeastern Ohio.
2. Institutional type - Hospital settings
3. Age – All respondents are 18 and over.
4. Gender – Most of the respondents were female. (79.1%)
5. Race – Ethnic minorities were underrepresented. (10.7%)
6. Education – Most of the respondents had a bachelor's degree or higher. (53.4%)

### **Assumptions of the study**

1. Smoking is perceived by the general public as not a healthy behavior choice.
2. Smoking is an addiction.
3. The participants filling out the questionnaire understand the definition of smoker.
4. The questionnaire will reflect the knowledge, attitudes, and behaviors of the respondents with a reasonable amount of accuracy.
5. Participants will be honest in answering survey questions.

### **Operational Definitions.**

The following terms are defined as used in this study.

Smoker – A person who has smoked within the last six months.

Former Smoker – A person who no longer smokes but used to smoke more than six months ago.

Nonsmoker - A person who has never smoked.

Psychological addiction – Addiction to cigarettes that can be attributed, at least partially, to psychological and/or social coping mechanisms of the individual.

Physiological Addiction – Addiction to cigarettes that can be attributed, at least partially, to a physical need for nicotine by the body to maintain homeostasis.

Total Ban - This is a workplace smoking policy whereby smoking is not permitted at all.

Partial Ban - This is a workplace smoking policy where smoking is permitted in designated areas.

### **Limitations of the Study**

1. The sample was one of convenience. Only the hospitals that gave permission took part in the study. Members of minority races, men, elderly, and unemployed are underrepresented or not represented in the study. Thus the generalizability of the results is limited.
2. This study represents the first time this instrument was used. Although reliability tests were run on the majority of the questions, only replication of the study would solidify reliability.
3. The opinions on the smoking policy questions may be skewed by workplace policies already in existence.
4. The definitions of smoker, former smoker, or nonsmoker were not defined in the questionnaire.

### **Summary**

Smoking cigarettes is a health behavior that causes and contributes to many diseases not only to the smoker, but also to the surrounding people in the same environment. In addition, a person who smokes also has to cope with the addiction to nicotine and the negative stigma that is attached to a person who smokes. The workplace is often the place that addresses the problem of environmental tobacco smoke by the implementation of a smoking policy.

Chapter II is a review of the literature that discusses the theories used as the foundation for the study. It also presents some of the prevailing facts about smoking behavior in general and presents the existing literature that examines workplace smoking policies.

Chapter III presents the methods and procedures used in the study and sets guidelines for data analysis.

Chapter IV presents the results of the data analysis. There is also a discussion of the results.

Chapter V is a summary of the findings, discussions, limitations and recommendations for further research.

## CHAPTER II

### LITERATURE REVIEW

The review of the literature consists of general information about smoking prevalence, the effects of smoking, background of the Health Belief Model, the constructs of the Health Belief Model, the relationship of cigarette smoking and the Health Belief Model, the problem of Environmental Tobacco Smoke, and the relationship of smoking and the workplace.

#### **Smoking Prevalence**

Twenty-five million men (27.6%) and 23 million women (22.1 %) Americans smoke on a daily basis. However, by the end of 2000, it is predicted that these figures will be reversed and more women will smoke than men. Another theme in the literature is that education is a good predictor of smoking behavior. People who have 9-11 years of education have the highest smoking rates (35.4 %) whereas smoking rates were lowest among adults who have 16 or more years of education (11.6 %). Smoking rates are higher among individuals who live below the poverty level (33.3 %) than those who live at or above the poverty level (24.6 %). From a historical perspective, smoker's aged 25-44 usually had the highest smoking prevalence of any age group. However, smokers age 18-24 are now the age group with highest prevalence at 28.7 %. This could be explained by previously high rates of underage smokers keeping the habit into adulthood. Figures for the other age subdivisions include: 25 to 44 years of age, 28.6 %; 45 to 64 years, 25.5 %; 65 years and older, 13.0 %. (CDC,1998)

The distribution geographically of smoking prevalence in the United States shows a great deal of variation from state to state. Kentucky and West Virginia have the highest

smoking rates, over 30 % for men and women. Utah and California are the only states below 20 %. They are 17.1 % and 19.5 % respectively. In general, adults in the southern region of the United States have higher rates of smoking than adults in the western part of the country, which have the lowest rates (Shopland, Hartmann, Gibson, Mueller, Kessler, & Lynn, 1996). The authors qualified their findings by noting that some of what they found could be attributed, at least partially, to the differences in the smoking behavior between men and women and among diverse racial and ethnic populations in various areas of the country.

The majority of smokers are of Caucasian non-Hispanic ancestry, but the rates of this group are decreasing faster than minority groups. There is no single factor that determines patterns of cigarette smoking among racial/ethnic minority groups. The patterns of use are the result of complex interactions of multiple factors, such as socioeconomic status, cultural characteristics, stress, biological aspects, varying differences of communities to mount effective anti-smoking campaigns. Smoking rates are generally declining for most groups. However, African-American and Hispanic American adolescents have shown an increase in rates since the early 1990's. Consequently, cigarette manufacturers have increasingly targeted certain races such as African-Americans or Hispanic Americans. The modes used to implement this strategy were through advertisement in magazines, garnering community loyalty by hiring community members, providing communities with revenues, and sponsoring cultural, athletic, entertainment events targeted at these groups (DHHS, 1998). Previously, billboards were strategically placed in minority communities, but recent legislation prohibits this visibility.

## **Effects of Smoking**

The Centers for Disease Control and Prevention estimated over each year as a result of smoking cigarettes. (American Lung Association, 1999) They also reported that smoking-related diseases cost the United States at least 97 billion dollars per year - 50 billion is direct healthcare costs (hospital care, physicians, and medications) and the remainder is money in lost productivity. Also in this report, nearly half of the 50 billion in direct healthcare costs are being paid by public funds. For every pack of cigarettes sold in the U.S., \$2 is needed for medical expenditures associated with the purchase of that pack.

The Surgeon General's Report in 1989 identified at least 43 carcinogens. The report also indicated that approximately 90 % of lung cancer cases are attributed to smoking. (DHHS, 1990) Smoking also can be an important factor in the development of other types of cancers such as cancer of the esophagus, gastrointestinal tract, urinary tract, and cervix. Smoking causes most cases of emphysema and chronic bronchitis. Smoking contributes to diseases of the circulatory system including arteriosclerosis, coronary heart disease, and stroke. In addition to these major life threatening illnesses, smoking is at least partially responsible for many other conditions and disorders such as infertility, slow wound healing, impotence, peptic ulcer, ectopic pregnancy, and bone density deficiencies in women (Hahn & Payne, 1998)

## **Background and Origins of The Health Belief Model**

The Health Belief Model (HBM) was truly one of the first theories developed specifically to explain health behavior. It's efforts grew out of a need to explain people's unwillingness to become involved with programs that would help to detect or prevent disease. The Health Belief Model's origins can be traced back to the 1950's as a synthesis of existing theories from social psychology. The two theories used to formulate the Health Belief Model were Stimulus-Response (S-R) Theory and Cognitive Theory.(Glanz, Lewis & Rimer, 1997)

Stimulus-Response Theory is based on the constructs of reinforcements and rewards to explain the behavior of individuals. Here learning is a result of either a reduction in behavioral drives due to the intervention of reinforcements or an increase in certain behaviors due to the presence of a reward if the proper behavior has taken place. One of the problems with S-R theory is that it does not address the ability of humans to reason. The Cognitive Theory, however, does address the mental processes of humans in terms of their decision-making. This theory is based on the notion that behavior depends on the individual's perception of probability that a particular action will achieve a particular outcome.

The Health Belief Model borrows more heavily on Cognitive theory. This is not to say that S-R theory is unimportant. S-R Theory lays the groundwork for the Health Belief Model in that reinforcements and rewards serve to influence expectations or hypotheses. The Cognitive theory influences behavior change more directly.



## **The Health Belief Model**

The Health Belief Model was used in this research as a theoretical base. This model poses many constructs and their relationships to one another in determining the likelihood to bring about a desired behavioral change.

The first component of the Health Belief Model involves those perceptions of individuals. The two major constructs within this component are perceived susceptibility and perceived severity. Perceived susceptibility is simply one's opinion of chances of becoming ill. The perceived severity construct is the individual's perception of the seriousness of an illness. (Strecher & Rosenstock, 1997)

The second component of the Health Belief Model involves those factors that modify the ability to make the desired behavior change. Key factors within this component include both ascribed and achieved characteristics of the individual. In turn these characteristics lead to cues to action. Cues to action are another construct of the Health Belief Model that are either internal or external triggers of individual action. (Strecher & Rosenstock, 1997)

The final component of the Health Belief Model is the likelihood of action. This component is an assimilation of the previous two components and their interaction with a person's perception of benefits and barriers to behavior change. A construct that pervades this component of the Health Belief Model is self-efficacy. It is a measure of an individual's ability to take action. In essence, if the person perceives by making a behavior change that the benefits are greater than the barriers to making the change, the greater degree of self-efficacy that person will have and the likelihood of behavior change is increased. (Bandura, 1977)

### **The Relationship between Cigarette Smoking and the Health Belief Model**

The literature on smoking in terms of the Health Belief Model usually focuses on one component of the Health Belief Model. (Strecher & Rosenstock, 1997) It is rare to find studies that encompass all the various aspects of the HBM.

Perhaps the reasoning for many studies not using all aspects of the HBM relates to the concepts of perceived susceptibility and perceived severity. It has been assumed that the differences between smokers' and nonsmokers' attitudes about threat are not statistically significant. In a 1992 study by Brownson, 83% of current smokers and 91% of nonsmokers felt smoking was harmful. This study also found that both groups were similar on benefits of quitting.

Another paradigm in looking at beliefs of smoking is to examine differences in beliefs and benefits of smokers and former smokers. One study found that fewer smokers (27.9%) than former smokers (42.1%) accepted that smoking causes disease (Chapman, Wong, & Smith, 1993). The diseases the authors of this study referred to were heart disease, poor circulation, bronchitis, lung cancer, and stroke.

The ability to get past perceived barriers to quitting is what determines the likelihood of behavioral change. The difficulty with quitting smoking is that there is a significant presence of both psychological and physiological barriers that interfere with smoker's success.

Congress and the media have recently given special attention to the addictive properties of cigarettes. From a physiological standpoint, the administration of nicotine for a few

weeks can bring about changes in the central nervous system and endocrine system that are indicative of physiological dependence (Henningfield & Keenan, 1993). Another aspect that is commonly associated with this type of dependence is a withdrawal response of the body when the individual experiences a period of prolonged absence of the drug in the body. Evidence for the physiological dependence aspect to smoking can be supported by a study conducted by Royce, Hymowitz, Corbett, Hartwell, & Orlandi in 1993. This study investigated the differences between African-Americans and Caucasians in terms of ability to quit smoking. The premise of the study took in two assumptions. The first was that smoking is more socially acceptable among Caucasians than among African-Americans. The second assumption was that African-Americans smoke fewer cigarettes per day than Caucasians on the average. However, when it came to quitting, Caucasians were more successful than African-Americans. Some of this could be explained by the disproportionate distribution of African-Americans in lower socioeconomic strata. This explanation could be used to explain psychological dependence. A more compelling indicator of the difficulty African-Americans have quitting is pharmacological in origin. African-Americans, although they smoke less, have the tendency to prefer menthol cigarettes. Menthol cigarettes have both higher tar and higher nicotine dosages. Consequently, the tolerance to nicotine is higher and a more traumatic withdrawal response would occur if a person were to attempt to quit. (Royce, Hymowitz, Corbett, Hartwell, & Orlandi, 1993)

The psychological dependence on cigarettes is another aspect of barriers to behavior change that also has been studied at some length in the literature. In a 1994 study conducted by Stretcher, most of the barriers were brought about from the person experiencing fear. Although related to physiological dependence, the fear of stress or anxiety from the absence of smoking is psychological. This stress is caused by the anticipation of withdrawal symptoms that will in all likelihood occur.

Another fear commonly perceived by people who are thinking about quitting smoking is the fear of gaining weight. Using cigarettes has long been associated with weight control and as some research indicates a reason why people, usually women more than men, begin to smoke.

Peer pressure is a commonly held explanation for adolescent smoking. A 1997 study conducted by Wolfson, Forster, Claxton, and Murray found that close to 75% of adolescents in the 8th, 9th, and 10th grades obtained cigarettes from friends or family members. In many studies determining predictors for adult smoking, adolescent smoking is commonly found to be the best predictor. (Paavola, Vartiainen, & Puska, 1996). The final fear of the Stretcher study was that fear of failure and relapse exists especially in situations where others are present to encourage relapse.

Very closely related to psychological dependence is a concept the Health Belief Model referred to as self-efficacy. This construct of the HBM is commonly believed by many researchers to be the strongest predictor of behavior change. (Stretcher & Rosenstock, 1997)

Although much of the research shows the use of only a portion of the Health Belief Model as a theoretical base for smoking behavior, one study used the entire model. (Mikanowicz, Fitzgerald, Leslie, & Altman, 1999) In this research, employees were administered a questionnaire that addressed the various constructs of the HBM. In addressing perceived benefits of smoking behavior, 31% of tobacco users felt smoking helped control weight and 82% felt tobacco use helped reduce tension. The researchers showed that a higher percentage of smokers perceived barriers to quitting than nonsmokers and former smokers. In terms of perceived susceptibility, a higher percentage of employees who never used tobacco products were more likely to believe smoking contributes to lung cancer and heart disease. However, in contrast to the 1992 Brownson study, the former users perceived less susceptibility than even current smokers. In evaluating the cue to action component of the HBM, 63% of smokers believed smoking was harmful and wanted to quit. However, only 41% actually wanted to enroll in a program to quit.

### **The Problem of ETS (Environmental Tobacco Smoke)**

Environmental tobacco smoke or “secondhand smoke” has been classified as a human (Group A) carcinogen by the Environmental Protection Agency. In a study by the EPA, second hand smoke was estimated to cause 37,000 deaths from heart disease and 13,000 deaths from cancers each year in the U.S. (EPA, 1992). Although this study has some detractors, it is still widely supported by the American Lung Association and other health organizations.

Forty-eight of the fifty states have some restriction on smoking in public places. These restrictions do vary from designated smoking areas to total bans. In terms of the workplace, 23 states restrict smoking in the workplace in the private sector and 43 states have restrictions in government workplaces. In August 1997, President Clinton signed an executive order banning smoking in federal buildings. (ALA, 1999)

### **The Relationship between Smoking and the Workplace**

Many workplaces now support some sort of smoking policy. Generally there are three major categories of smoking policies. The first smoking policy would be a total ban policy. As the name implies, this plan is where smoking is not permitted anywhere on the premises. The second type is a partial ban. This policy is where smoking may be permitted in designated areas of the workplace. The third type of policy would be to have no policy and smoking would be permitted anywhere at the worksite. (Mikanowicz & Altman, 1995)

More than 80 % of workers are covered by an official workplace smoking policy (Gerlach, Shopland, Hartman, Gibson, & Pechacek, 1997). However, less than half are actually protected by smoking policies that prohibit smoking in both the work area and common areas of the workplace. Of those who work indoors, an estimated 58 million Americans (40 million of whom are not smokers) are not protected by a smoke-free workplace policy (Gerlach, Shopland, Hartman, Gibson, & Pechacek, 1997). This research also found that white-collar workers (53.7 %) were more likely than service workers (34.8 %) and blue-collar workers (27.4 %) to be covered by a smoke free policy.

A meta-analysis of various workplaces in Australia and the United States that instituted a total ban policy found significant results to support a perceived change in behavior. Nineteen studies between 1986 and 1996 were evaluated in this analysis. The researchers showed that 18 out of the 19 studies reported a daily decline of smoking rates and 17 of the 19 studies reported a decline in smoking prevalence. With the advent of the smoking ban, a reduction of 602 million cigarettes consumed in Australia and a reduction of 9.7 billion cigarettes per year in the United States could be attributed to a total ban on smoking in the workplace. This reduction accounts for approximately 2% of all cigarettes smoked annually in each country. This study also made a projection that if workplaces were universally smoke free, the reduction of cigarettes consumed would almost double to 1.17 billion in Australia and more than double to 20.7 billion in the United States (Chapman, Borland, Scollo, Brownson, Dominello, & Woodward, 1999).

The United States and Australia are further along than other parts of the world in trying to reduce exposure to ETS in the workplace. A study of the German metal industry revealed that in that industry, only 30% of the employees were not allowed to smoke in their immediate work area. (Brenner, Born, Novak, & Wanek, 1997) This study also showed a greater social acceptance of smoking in that 60% of nonsmoking blue-collar workers and 52% of nonsmoking white-collar employees would be bothered by passive smoking if smoking were permitted in their work area. Despite this difference from the United States and Australia, the German metal industry was shown to have one major similarity. Smoking prevalence and smoking intensity among active smokers was significantly lower if the employees worked at a job where smoking was banned. This study along with the Chapman et al 1999 study lends strong support for the effectiveness of a smoking ban in the workplace.

Some studies compare the differences between the effects of total bans versus partial bans in terms of behavior changes among those employees who smoked. One such study was conducted on 242 smokers who worked at places that had either total or partial ban policies. The researchers concluded that smokers who worked at jobs that had total bans were more likely to stop smoking during the workday than those employees who smoked and worked at a place with only a partial ban. It also found that smokers in partial bans actually were more likely to increase their smoking during work hours. Although there were many significant differences in behavior between the two groups, the attitudes about workplace smoking policies of both groups were very similar, regardless of smoking policy existing at their job. (Styles & Capewell, 1998)



Another study did a comparison of one workplace with a total ban and another with no smoking policy. This study was conducted at two hospitals, one was about to implement a smoking ban (experimental group) and the other was not (control group). Both groups were similar in age, gender, and occupational status. Both groups were evaluated 4 weeks before the smoking ban and again at 4 weeks after the smoking ban. Smokers in the experimental group on the average reduced their smoking during work hours from 7.57 cigarettes per day before the smoking ban to 3.64 per day after the ban. There was no significant increase in cigarettes during non-work hours and no significant change in smoking behavior of the control group. (Brigham, Gross, Stitzer, & Felch, 1994)

Other studies discovered in the literature not only evaluate change in smoking behavior, but also evaluate change in work behavior as a result of an implementation of a smoking policy. One such study occurred when employees (smokers and nonsmokers) of a Scottish University evaluated their change in work habits, a majority of the workers did not change their work habits. The work habits specifically measured in this study were the amount of time employees spent in the immediate work area before their shift actually started, working beyond their scheduled time, lunch breaks, and the number of hours worked per week. However, of the minority that reported a change in work behaviors, there were significant differences between smokers and nonsmokers. Eighteen percent of smokers reported that they spend less time in their working area since the introduction of the ban whereas only 0.2% of nonsmokers reported doing the same. In terms of spending less time before the official start of the shift, 19.7% of the employees who smoke and 0.1% of the employees who don't smoke reported this behavior change. In terms of

staying late, 16.7% smokers and 0.3% nonsmokers reported staying late. (Parry, Platt, & Thomson, 1999)

These concepts could be considered the most problematic and may cause dissension among smokers and nonsmokers. The notion that nonsmokers are less productive than smokers is usually the precursor to the dissension. Although the dangers of ETS and second hand smoke have been well documented, management must be sensitive not only to the needs of the nonsmokers, but to the needs of smokers as well.

### Summary

Cigarette smoking is a habit that not only affects the person doing it. It also has effects psychologically and physiologically on others as well as the smoker. This chapter provides a theoretical framework examining smoking behavior and how it relates to the workplace. The Health Belief Model is the theoretical framework used to associate these aspects to this habit.

Chapter III outlines the sample, instrumentation, methodologies for collection and analysis of the data to determine the relationship between smoking behavior as it relates to the habit in general, and the presence or absence of workplace smoking policies.

Chapter IV presents the results of the analysis as it relates to significant literature presented here as well as the hypotheses.

Chapter V presents a discussion of the findings as well as the recommendations for further research.

## CHAPTER III

### METHODS

Chapter III provides an outline of the sample research methodologies and statistical treatment of the data obtained. The data were used to detect differences in attitudes and behaviors of tobacco use in people in a work environment. Therefore, the subjects for this study were acquired by contacting the local hospitals and getting permission to distribute the questionnaire to employees at the hospital.

#### **Research Design**

The design consisted of survey research using both descriptive and inferential statistics. Two hospitals, both part of the same corporation, agreed to participate in the study. One hospital was located in Mahoning County and the other hospital was located in Trumbull County. They were categorized into three categories smokers, non-smokers and former smokers by self-report. Descriptive statistics were used to understand the prevalence of smoking behavior in this population augmented by various demographical characteristics. The inferential statistics were used to develop two scales. One scale is a combination measure of knowledge and attitudes. The other scale is a measure of an employee's tolerance to workplace smoking.

### **Subjects.**

The sample consisted of 206 healthcare workers in a hospital environment. Although all employees of the hospital were allowed to participate, the majority of the respondents were nurses. There were both male and female respondents ranging from 22 to 82 years of age.

### **Instrument**

The questionnaire used for this study was developed specifically for this research. Realizing there were some differences in the demographics of the subjects, the questionnaire was developed respecting cultural sensitivity. The questions were developed to prevent bias against anyone based upon one's health choices. The 38-item questionnaire was divided into three parts. The first part contained demographic, occupational and personal smoking behavior questions. The second part was nineteen Likert scale questions that asked knowledge and attitudes about smoking in general. The responses for the second part were Strongly Agree, Agree, Disagree, and Strongly Disagree. These questions were used to develop the Total Smoking Inventory Scale. The third part was six Likert scale questions that asked the subject's opinion about workplace smoking policy. The responses for these questions were also Strongly Agree, Agree, Disagree, and Strongly Disagree. These questions were used to develop the Workplace Permissiveness Scale. A copy of the questionnaire is located in Appendix A.

### **Collection of Data**

Prior to collection of data, the researcher obtained an approval letter from the Youngstown State University Human Subjects Committee contained in Appendix B. The researcher also submitted a proposal to the hospital system Institutional Review Board and was granted permission to administer the survey to both hospitals. The approval letter from the Institutional Review Board of the employer is in Appendix C. The researcher then agreed to meet with a member of the hospital on the dates to administer the survey. The researcher distributed the questionnaires to employees during the lunch hours i.e. 11:00 a.m. to 2:00 p.m. One hospital was done one day and the other was done the following day. The respondents were given the questionnaire on their way in the hospital cafeteria and asked to return them on their way out. The letter of consent that preceded the questionnaire is in Appendix D. In the letter of consent, it indicated to participants that taking part in the study was voluntary. All potential subjects were assured absolute anonymity. At the completion of each questionnaire, the letter of consent was placed in a separate envelope from the survey. Once the survey was collected, they were placed in an envelope and sealed until the researcher was ready to enter the data. All data were entered into the SPSS Data sheet by the researcher. To make sure the data was entered correctly, the researcher checked the data sheet for errors.

### **Statistical Treatment of Data**

All analyses of the data were done with SPSS (Statistical Package for the Social Sciences) for Windows 8.0(1998). The data were tested with both descriptive and inferential statistical procedures.

The data from the first section of the questionnaire were used for most of the descriptive statistics. Frequency distributions and percentages for answers to the first thirteen items of the questionnaire were performed to assess for trends and for comparison in later tests.

The Likert scale items 14-32 in the survey were standardized into z-scores. Some of the items were reverse-scored. All of the items in this section were then tested for reliability using the reliability procedure in SPSS. This procedure determined the reliability of each item individually and then those items that were similar in terms of the correlation coefficient were selected. Those items that were reliable ( $r \geq .31$ ) were combined to form an index of smoking knowledge and beliefs. Those items that were not reliable were discarded from further analysis.

A bivariate linear regression analysis was performed using the smoking category variable as the independent variable and the total smoking inventory score as the dependent variable. The results of the tests along with the corresponding ANOVAs and coefficients were used to assess Hypothesis 1.

The last portion of the questionnaire described items related to respondents' opinions on workplace smoking policies. These items were summed to form a total score for permissiveness for smoking in the workplace. All of the items were standardized including the total score. A bivariate linear regression analysis was performed using smoking as the independent variable and the work permissiveness score as the dependent variable. The results of the tests along with the corresponding ANOVAs and correlation coefficients were calculated to test Hypothesis 2.

## Summary

This chapter described the research methodologies used to determine the relationship of smoking as it relates to beliefs and knowledge about the consequences of the habit. It also provides a foundation for the relationship of smoking behavior as it relates to the formulation of a workplace smoking policy.

Chapter IV presents the results of the study using the methodologies outlined in this chapter.

Chapter V further explains the findings in discussion, implications, and recommendations for further research.

## CHAPTER IV

### RESULTS OF THE ANALYSIS

Information from the smoking in the workplace questionnaire was used to determine smoking behavior's relationship toward the knowledge and attitudes about smoking. From the results, two scale scores were produced to determine the predictiveness and relative significance of performance on these scales based upon smoking behavior. One scale reviewed a combination of attitudes and knowledge about smoking cigarettes. The other scale reviewed opinions on smoking restrictions in a healthcare setting.

Each participant completed the questionnaire that was divided into three parts. The first part of the questionnaire identified the participant's demographical information along with participant's smoking behavior. The second part of the questionnaire consisted of Likert Scale questions about knowledge, attitudes, and behavior as it related to smoking using the various constructs of the Health Belief Model. This part comprised the questions that would be used in the development of the Total Smoking Inventory Scale. The third part of questionnaire consisted of Likert scale questions that asked opinions about workplace smoking policy and were used to construct the Workplace Permissiveness Scale.

#### **Profile of the subjects**

Three-hundred seventy-five questionnaires were distributed to employees of two hospitals that were part of the same corporation. One was located in Youngstown, Ohio in Mahoning County and the other was located in Warren, Ohio in Trumbull County. Two hundred six returned the surveys for a response rate of 55%.



The age of the participants ranged from 22 to 82 years of age. When grouped in age categories similar to CDC intervals, the greatest numbers of participants were aged 22-44 years at 55% of the entire sample followed by 45-64 years accounting for 39% of the sample. The mean age for the entire group was 43.9 years old. All of the subjects who reported that they currently smoke were between 25 and 64 years of age. The 18-24 year old, and the 65 and older intervals reported no current smoking behavior (Table 1).

Table 1  
Number and Percentage of Healthcare Workers Smoking Behavior by Age  
(N=206)\*

VARIABLE	N	Percent by age
<b>Age 22-44</b>		
CIGARETTE	17	14.91%
CIGAR OR PIPE	4	3.51%
SMOKELESS	2	1.75%
NEVER SMOKER	68	59.65%
FORMER SMOKER	23	20.18%
TOTAL	114	100%
<b>Age 45-64</b>		
CIGARETTE	15	18.75%
CIGAR OR PIPE	0	0
SMOKELESS	1	1.25%
NEVER SMOKER	47	58.75%
FORMER SMOKER	17	21.25%
TOTAL	80	100%
<b>Age 65 and over</b>		
CIGARETTE	0	0%
CIGAR OR PIPE	0	0%
SMOKELESS	0	0%
NEVER SMOKER	6	60%
FORMER SMOKER	4	40%
TOTAL	10	100%

\* There were 2 missing values

Nearly 80% of the respondents were female. Over 18% of the females smoked either cigarettes, cigars or a pipe. Only 3% of the women reported smoking used cigars or pipes. None of the women reported smokeless tobacco use. Fourteen percent of men reported using cigarettes, cigars, and pipes. However, the frequency of men smoking cigarettes was equal to the number of men smoking cigars or pipes. Factoring in smokeless tobacco use, 21% of men used tobacco products (Table 2).

Table 2  
Number and Percentage of Healthcare Workers Smoking Behavior by Gender  
(N=206)\*

	VARIABLE	N	Percent by gender
Male	CIGARETTE	3	7.00%
	CIGAR OR PIPE	3	7.00%
	SMOKELESS	3	7.00%
	NEVER SMOKER	24	55.80%
	FORMER SMOKER	10	23.30%
	TOTAL	43	100%
Female	CIGARETTE	29	17.90%
	CIGAR OR PIPE	1	0.60%
	SMOKELESS	0	0.00%
	NEVER SMOKER	98	60.50%
	FORMER SMOKER	34	21.00%
	TOTAL	162	100%

\*There was 1 missing value

The majority of the respondents had completed some post secondary education (29.6% bachelor's degree, 23.8% beyond a bachelor's degree). In terms of smoking behavior, 18% of the respondents were current smokers (16% cigarette and 2% cigar or pipe), 2% smokeless tobacco users, 20% were former smokers and 60% were never smokers. Sixty-nine percent of the cigarette smokers had the educational level less than a completed bachelor's or trade school degree. However, all of the respondents who reported using other tobacco products such as cigars, pipes, and smokeless were at least trade school graduates or higher. Over 50% of this population had some postgraduate education. (Table 3).

Table 3  
 Number and Percentage of Healthcare Workers Smoking Behavior by Education  
 (N=206)\*

VARIABLE	N	Percent
<b>GED</b>		
CIGARETTE	0	0.00%
CIGAR OR PIPE	0	0.00%
SMOKELESS	0	0.00%
NEVER SMOKER	1	100.00%
FORMER SMOKER	0	0.00%
TOTAL	1	100%
<b>High School Graduate</b>		
CIGARETTE	12	38.70%
CIGAR OR PIPE	0	0.00%
SMOKELESS	0	0.00%
NEVER SMOKER	16	51.60%
FORMER SMOKER	3	9.70%
TOTAL	31	100%
<b>Some college or trade school</b>		
CIGARETTE	10	21.70%
CIGAR OR PIPE	0	0.00%
SMOKELESS	0	0.00%
NEVER SMOKER	25	54.30%
FORMER SMOKER	11	23.90%
TOTAL	46	100%
<b>Trade school graduate</b>		
CIGARETTE	2	11.80%
CIGAR OR PIPE	0	0.00%
SMOKELESS	1	5.90%
NEVER SMOKER	11	64.70%
FORMER SMOKER	3	17.60%
TOTAL	17	100%
<b>Bachelor's degree</b>		
CIGARETTE	4	6.60%
CIGAR OR PIPE	2	3.30%
SMOKELESS	0	0.00%
NEVER SMOKER	41	67.20%
FORMER SMOKER	14	23.00%
TOTAL	61	100%
<b>Post graduate degree</b>		
CIGARETTE	4	8.20%
CIGAR OR PIPE	2	4.10%
SMOKELESS	2	4.10%
NEVER SMOKER	28	57.10%
FORMER SMOKER	13	26.50%
TOTAL	49	100%

\* 1 missing value

In terms of racial composition, 89% of the sample was Caucasian. Of this group, 18.5% were current smokers and 22% were former smokers. Twenty-nine percent of African-Americans who responded were smokers as opposed to 14% who were former smokers. None of the Native Americans or Asian Americans reported that they were currently smoking. However, 66% Asian Americans were former smokers (Table 4).

Table 4  
 Number and Percentage of Healthcare Workers Smoking Behavior by Race  
 (N=206)\*

	VARAIBLE	N	Percent
Native-American	CIGARETTE	0	0.00%
	CIGAR OR PIPE	0	0.00%
	SMOKELESS	0	0.00%
	NEVER SMOKER	8	100.00%
	FORMER SMOKER	0	0.00%
	TOTAL	8	100%
Asian-American	CIGARETTE	0	0.00%
	CIGAR OR PIPE	0	0.00%
	SMOKELESS	0	0.00%
	NEVER SMOKER	2	66.67%
	FORMER SMOKER	1	33.33%
	TOTAL	3	100%
African-American	CIGARETTE	2	28.60%
	CIGAR OR PIPE	0	0.00%
	SMOKELESS	0	0.00%
	NEVER SMOKER	4	57.10%
	FORMER SMOKER	1	14.30%
	TOTAL	7	100%
Hispanic-American	CIGARETTE	0	0.00%
	CIGAR OR PIPE	0	0.00%
	SMOKELESS	1	100.00%
	NEVER SMOKER	0	0.00%
	FORMER SMOKER	0	0.00%
	TOTAL	0	100%
Caucasian	CIGARETTE	30	16.30%
	CIGAR OR PIPE	4	2.20%
	SMOKELESS	2	1.10%
	NEVER SMOKER	107	58.20%
	FORMER SMOKER	41	22.30%
	TOTAL	184	100%
Other	CIGARETTE	0	0.00%
	CIGAR OR PIPE	0	0.00%
	SMOKELESS	0	0.00%
	NEVER SMOKER	2	100.00%
	FORMER SMOKER	0	0.00%
	TOTAL	2	100%

\* 2 missing values

Before a test for significance was run, some manipulation of the data were necessary. Some of the items for the Total Smoking Inventory were reverse-scaled so that a higher value reflected a pro-smoking behavior, knowledge, or attitude. (i.e. 1=antismoking, 4=pro-smoking)

After reverse scaling was completed, an item analysis using the reliability procedure was implemented. The item analysis was conducted on 19 items. Based on the results, nine of the items were found not to be reliable because the corrected item correlations were much lower than lowest correlation selected ( $r = .31$ ). Each eliminated item was individually placed back in with the 10 chosen items to double check the current correlation range. None of the nine eliminated items could be assimilated back in with the 10 selected. (Table 5)

Coefficient alpha for the Total Smoking Inventory Scale was .75. Because the sample was one of convenience and used both for the item analysis and the computation of the coefficient alpha, the reliability is likely to be an overestimate of the general population Coefficient Alpha. A total score was computed by summing the total of the values of the 10 selected items. The total score was then standardized by the use of z-scores. This would make it easier to conduct further analyses.

Table 5  
Reliability Analysis of Total Smoking Inventory Items

VARIABLE	Mean	Std Dev	Cases
Nicotine is addictive	1.2606	.5385	188.0
Tobacco leads to disease	1.1543	.4171	188.0
Tobacco costs 100 billion per year	1.5479	.9881	188.0
Smoking should not be regulated	2.3032	1.0283	188.0
Advertising influences tobacco use	2.1064	.8461	188.0
Promotions influence tobacco use	2.2766	.8389	188.0
Secondhand smoke effects are exaggerated	1.6755	.7712	188.0
Smoking laws should be enforced	2.2500	.8629	188.0
Cigarette taxes are unfair	1.8989	.9223	188.0
It's okay if my friends smoke	2.3511	1.3098	188.0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	18.8245	23.8032	4.8789	10

Item-total Statistics

VARIABLE	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Nicotine is addictive	17.5638	21.9264	.3147	.7385
Tobacco leads to disease	17.6702	21.8479	.4569	.7311
Tobacco costs 100 billion per year	17.2766	19.9552	.3253	.7390
Smoking should not be regulated	16.5213	18.7963	.4430	.7201
Advertising influences tobacco use	16.7181	20.3212	.3626	.7315
Promotions influence tobacco use	16.5479	20.2063	.3836	.7286
Secondhand smoke effects are exag	17.1489	19.5606	.5348	.7093
Smoking laws should be enforced	16.5745	19.5934	.4536	.7186
Cigarette taxes are unfair	16.9255	18.6468	.5405	.7043
It's okay if my friends smoke	16.4734	17.3950	.4295	.7300

Reliability Coefficients

N of Cases = 188.0

N of Items = 10

Alpha = .7459



The rest of the chapter was organized by the hypotheses that guided this study.

**Hypothesis 1:** There are significant differences among smokers, nonsmokers, and former smokers in terms of health beliefs about smoking.

This hypothesis evaluates the significance of the differences in smoking beliefs, behaviors, and knowledge about cigarette use among three groups; smokers, never smokers, and former smokers.

A linear regression equation was calculated using actual smoking behavior as independent variable and the total inventory score as the dependent variable. The following equation was derived from analysis:

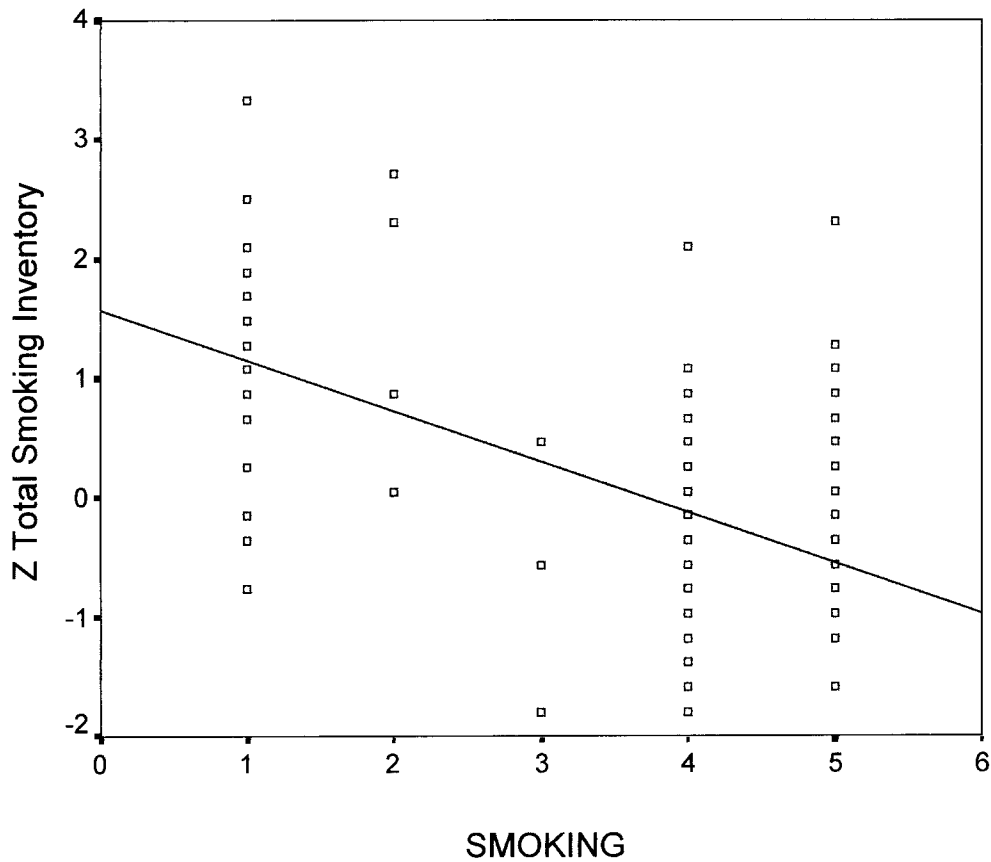
$$Y_{\text{predicted inventory score}} = -.69X_{\text{smoking behavior}} + 3.692$$

The equation indicates that smoking behavior predicts higher scores on the total smoking inventory scale. The slope weight is negative because the value assigned to smokers is lower than nonsmokers and former smokers. The regression equation was then standardized so the slope weight could be interpreted more easily (Figure 1).

$$\text{Predicted } Z_{\text{inventory score}} = -.54 \text{ smoking behavior}$$

The correlation between the total inventory score and smoking behavior was  $r^2 = .29$ ,  $t(203) = 92$ ,  $p \leq .001$ .

Figure 1. The Relationship Between Smoking and Total Smoking Inventory



On the smoking line 1= cigarette smoker, 2= cigar or pipe smoker, 3= smokeless tobacco, 4= never smoker, and 5= former smoker

In order to determine significance in the differences in Total Smoking Inventory Scale scores among the various groups categorized by smoking behavior, a one-way Analysis of Variance (ANOVA) was conducted to evaluate the relationship between smoking behavior and the differences in the scores on the Total Smoking Inventory scale. The independent variable, smoking, included five levels, cigarette smokers, cigar or pipe smokers, smokeless tobacco users, never smokers, and former smokers. The dependent variable was the score on the Total Smoking Inventory scale. (Figure 1)

The ANOVA was significant,  $F(4,200) = 36.96, p < .001$ . The strength of the relationship between smoking and scores on the scale, as assessed by eta-squared, were moderately strong as the smoking factor accounted for 43% of the variance of the dependent variable.

Table 6  
ANOVA Hypothesis 1  
Dependent Variable: Zscore(Total Smoking Inventory)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	87.108	4	21.777	36.964	.000	.425
Intercept	5.009	1	5.009	8.502	.004	.041
SMOKING	87.108	4	21.777	36.964	.000	.425
Error	117.829	200	.589			
Total	204.937	205				
Corrected Total	204.937	204				

a R Squared = .425 (Adjusted R Squared = .414)

Follow-up tests were conducted to evaluate pairwise differences among the means. Because the variance among the five groups ranged from .49 to 1.54, post-hoc comparisons assuming variances to be homogenous were conducted. The post-hoc test used was the Tukey HSD. There were significant differences in the means of cigarette smokers with all other categories except cigar and pipe smokers. Differences in the means among smokeless tobacco users, never smokers, and former smokers were not significant. (Table 7)

Table 7  
 Tukey HSD Post hoc Comparisons  
 Dependent Variable: Zscore(Total Smoking Inventory)

		Mean Difference (I-J)	Std. Error	Sig.
CIGARETTE	CIGAR OR PIPE	-.1216978	.407	.998
	SMOKELESS	1.9962710	.463	.000
	NEVER SMOKER	1.7431452	.152	.000
	FORMER SMOKER	1.3782713	.178	.000
CIGAR OR PIPE	CIGARETTE	.1216978	.407	.998
	SMOKELESS	2.1179688	.586	.003
	NEVER SMOKER	1.8648430	.390	.000
	FORMER SMOKER	1.4999691	.401	.002
SMOKELESS	CIGARETTE	-1.9962710	.463	.000
	CIGAR OR PIPE	-2.1179688	.586	.003
	NEVER SMOKER	-.2531258	.449	.980
	FORMER SMOKER	-.6179997	.458	.660
NEVER SMOKER	CIGARETTE	-1.7431452	.152	.000
	CIGAR OR PIPE	-1.8648430	.390	.000
	SMOKELESS	.2531258	.449	.980
	FORMER SMOKER	-.3648739	.135	.053
FORMER SMOKER	CIGARETTE	-1.3782713	.178	.000
	CIGAR OR PIPE	-1.4999691	.401	.002
	SMOKELESS	.6179997	.458	.660
	NEVER SMOKER	.3648739	.135	.053

Based on observed means.

\* The mean difference is significant at the .05 level.

**Hypothesis 2:** There are significant differences between smokers, nonsmokers, and former smokers in terms of attitudes toward workplace smoking policies

This hypothesis evaluates differences among smokers, former smokers, and never smokers and their attitudes toward workplace smoking policies. A linear bivariate regression was conducted using smoking behavior as the independent variable and the Z score of the total score of the workplace permissiveness scale questions. The regression equation derived from the sample was the following:

$$Y_{\text{predicted smoking permissiveness}} = .335X_{\text{smoking behavior}} - 1.232$$

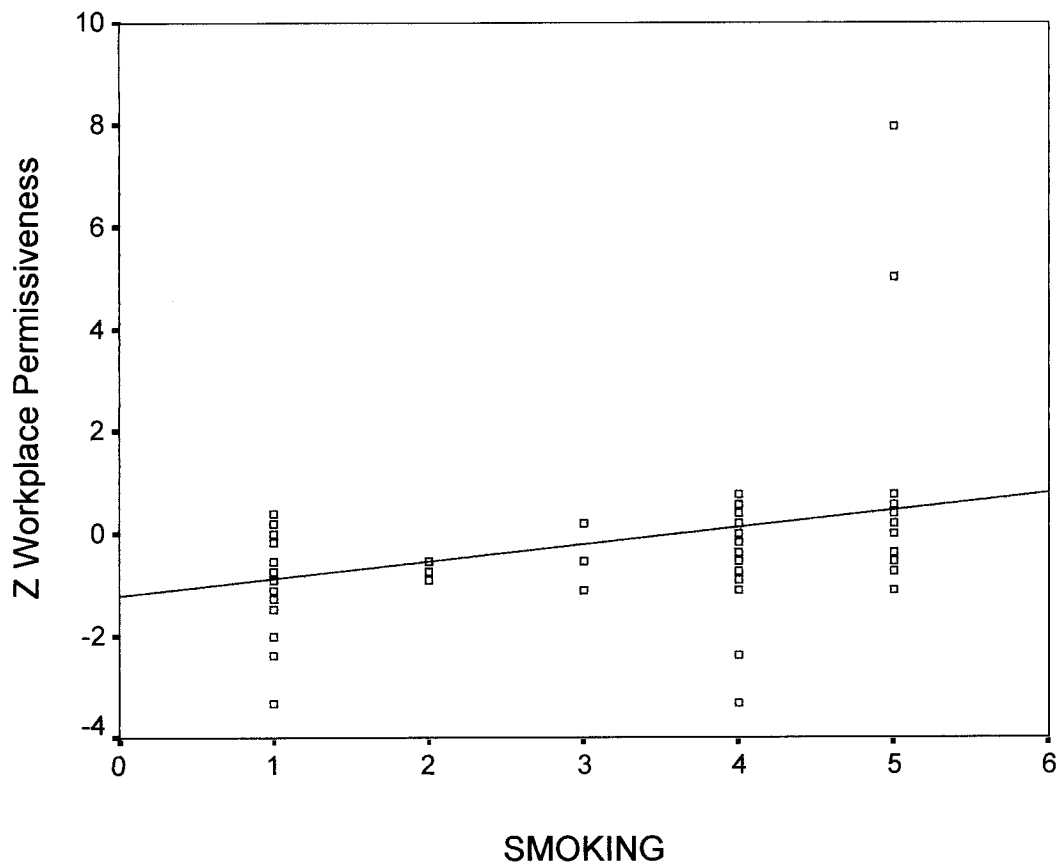
The results suggested that people who do not smoke will support more restrictive workplace smoking policies and conversely those who do smoke will support those policies that will allow for less restriction. The slope is positive in this equation because a higher score on this score indicates support for more restrictions and the value assigned to smokers is lower than never smokers and exsmokers. (Figure 2) To better understand how well the slope weight predicts a workplace permissiveness scale score, the above equation was standardized to the following:

$$\text{Predicted } Z_{\text{workplace permissiveness}} = .42 \text{ Smoking behavior}$$

The correlation between smoking and the workplace permissiveness score was  $r^2 = .18$ ,  $t(203) = 6.7$ ,  $p < .001$ . In order to determine significance in differences in Work Permissiveness scores among the various groups categorized by smoking behavior, a one-way Analysis of Variance (ANOVA) was conducted to evaluate the relationship between smoking behavior and the differences in the scores on the Work Permissiveness scale. The independent variable, smoking, included five levels, cigarette smokers, cigar or pipe

smokers, smokeless tobacco users, never smokers, and former smokers. The dependent variable was the score on the Work Permissiveness scale.

Figure 2. The Relationship Between Smoking and Workplace Permissiveness



On the smoking line 1= cigarette smoker, 2= cigar or pipe smoker, 3= smokeless tobacco, 4= never smoker, and 5= former smoker

The ANOVA was significant,  $F(4,200) = 9.79, p = .019$ . The strength of the relationship between smoking and scores on the scale, as assessed by eta-squared, were

moderately strong as the smoking factor accounted for 19% of the variance of the dependent variable. (Table 8)

Table 8  
ANOVA Hypothesis 2  
Dependent Variable: Zscore(Workplace Permissiveness)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	39.155	4	9.789	11.866	.000	.192
Intercept	4.606	1	4.606	5.584	.019	.027
SMOKING	39.155	4	9.789	11.866	.000	.192
Error	164.990	200	.825			
Total	204.149	205				
Corrected Total	204.145	204				

a R Squared = .192 (Adjusted R Squared = .176)

Follow-up tests were conducted to evaluate pairwise differences among the means. Because the variance among the five groups ranged from .03 to 2.25 and Levene's Test for Equality of Error Variances was not significant,  $p = .255$ , post-hoc comparisons assuming variances to be nonhomogenous were conducted. Since Tukey's HSD test is more appropriate when the variances are homogenous, the post-hoc test used with this hypothesis was the Dunnett's C test. There were significant differences in the means of cigarette smokers with former smokers and never smokers. The differences were not significant when cigarette smokers were compared to cigar/pipe smokers and smokeless tobacco users. Similar to cigarette smokers, differences in the means of cigar/pipe smokers were significant when compared to never smokers and former smokers. Smokeless tobacco users had no significant differences among any other category. Never smokers and former smokers also showed no significant difference in means.

Table 9  
Dunnett's C Post hoc Comparisons  
Dependent Variable: Zscore(Workplace Permissiveness)

		Mean Difference (I-J)	Std. Error	Sig
CIGARETTE	CIGAR OR PIPE	-.1502096	.482	
	SMOKELESS	-.4429258	.548	
	NEVER SMOKER	-1.1147335	.180	*
	FORMER SMOKER	-1.2384416	.211	*
CIGAR OR PIPE	CIGARETTE	.1502096	.482	
	SMOKELESS	-.2927162	.694	
	NEVER SMOKER	-.9645239	.462	*
	FORMER SMOKER	-1.0882320	.474	*
SMOKELESS	CIGARETTE	.4429258	.548	
	CIGAR OR PIPE	.2927162	.694	
	NEVER SMOKER	-.6718077	.531	
	FORMER SMOKER	-.7955158	.542	
NEVER SMOKER	CIGARETTE	1.1147335	.180	*
	CIGAR OR PIPE	.9645239	.462	*
	SMOKELESS	.6718077	.531	
	FORMER SMOKER	-.1237081	.160	
FORMER SMOKER	CIGARETTE	1.2384416	.211	*
	CIGAR OR PIPE	1.0882320	.474	*
	SMOKELESS	.7955158	.542	
	NEVER SMOKER	.1237081	.160	

Based on observed means.

\*  $p < .05$

### Summary

This chapter presented the results of the analysis. Both hypotheses were confirmed as a result of the analysis. Also cigarette smoking is a moderately strong predictor for a higher score on the Total Smoking Inventory Scale and a lower score on the Workplace Permissiveness Scale.

Chapter V will present some conclusions and recommendations for further research beyond the scope of this study.



## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

Despite the documented harmful effects of smoking, not only on the smoker but anyone in the immediate area, smoking remains a major barrier to a healthy lifestyle for many. Close to 50 million adults in the United States smoke (CDC, 1998). In the workplace, smoking is increasingly being banned. Banning smoking in the workplace seems to be an effective tool in reducing the frequency with which one smokes. However, there are many workplaces that tolerate smoking. Thirty-eight percent of the adult smoking population can smoke. For every person that smokes in the workplace, two coworkers that do not smoke will be exposed to ETS (Gerlach, Shopland, Hartman, Gibson & Pechacek, 1997).

The purpose of the present study was to measure various aspects of smoking behavior among a working population in a local healthcare setting. Relationships between smoking behaviors, age, education and race were examined. The relationship between smoking behavior, knowledge, and attitudes about smoking was evaluated for linear relationships and differences in attitudes and knowledge based upon the smoking behavior of the sample. Two hundred and six respondents completed the questionnaire. The respondents were employees of two hospitals located in Northeast Ohio.

The theoretical basis for the study was the Health Belief Model. This model explained willingness of a person to make a health behavior change based upon various perceptions of the individual. These perceptions basically weighed the benefits of changing the behavior; assess the risks in maintaining the negative health behavior, and evaluating the sacrifices and the difficulty in making the behavior change.

These perceptions were heavily based on the beliefs and the knowledge that person has about the behavior previous to making the choice whether or not to undertake the positive behavior. In terms of smoking behavior, based upon the linear relationship found in Hypothesis 1, most of those people who continued to smoke did so because the mindset was such that the barriers to quitting did not outweigh the perceptions of susceptibility and severity of and to illness.

Banning smoking in the workplace, although thrust upon smokers, is a cue to behavior change. It changes the perception of their ability to deal with the sacrifices they must make in order to keep their job. Although there was a linear relationship and significant differences among smokers, nonsmokers and former smokers, it was not as strong in Hypothesis 2 as in Hypothesis 1. Thus the cue to action with the advent of a workplace smoking ban has had an effect on smokers.

## Conclusions

There was a linear relationship between smoking behavior and the score on the Total Smoking Inventory scale (which consisted of knowledge and attitudes about smoking behavior). Hypothesis 1 was confirmed, as there were significant differences among the smokers, never smokers, and former smokers score on this scale. Thus indicating there still are some differences in knowledge and attitudes. Smokers tended to have less knowledge about the effects of smoking and the attitudes of smokers tended to favor a lowered perception of susceptibility and severity.

There was a linear relationship between smoking behavior and the score on the Work Permissiveness scale (which asked questions about smoking in the workplace). Hypothesis 2 was confirmed, as there were significant differences among the smokers, never smokers, and the former smokers on this scale. This result would indicate that nonsmokers (both former smokers and never smokers) favored more stringent workplace smoking policies than smokers.

The participants in the study displayed differences in their beliefs and knowledge of smoking based upon their own behavior. This is consistent with the literature. Most of the subjects thought that smoking was not a positive health behavior, but the severity of the behavior was the construct where the difference in knowledge and attitude prevailed. The participants in this study also showed differences in their beliefs about workplace smoking policy based upon their own behavior. The differences in this evaluation were not as great as the differences in knowledge and attitudes about smoking behavior in general. However, there was more acceptance of policies against smoking in the

workplace by smokers. If employers would offer a smoking cessation program in conjunction with a ban on smoking, this may lead more smokers to quitting.

Smoking behavior in relationship with other demographic factors such as age, gender, race, and education remained fairly consistent with the literature. A majority of the smokers were aged 25-44. Contradictory to the literature, the smoking rates among men were less than women. However if you added the use of smokeless tobacco, rates of use in men would surpass women. African-Americans had higher smoking rates than Caucasians. This is not consistent with the literature and probably due to the sample being a sample of convenience. Those subjects whose highest educational attainment was a high school diploma were more likely to be smokers than those who had either a college or trade school degree.

### **Recommendations**

Studies similar to the one-presented need to be conducted in Mahoning and Trumbull Counties. Particularly those worksites that have little or no ban on smoking need to be evaluated. Due to the underrepresentation of men and various minority races including African-Americans, Native Americans, and Asian Americans, more studies with a better representation of these groups should be conducted.

There was a strong relationship between education and smoking behavior. However, an interesting trend that should be investigated is that men who have the highest education levels (i.e. graduate degrees) preferred other tobacco products such as smokeless tobacco, cigars, or tobacco pipes. The health effects such as cancers of mouth and larynx are different than the effects of cigarette smoking (Hahn & Payne 1998). So prevalence rates of these cancers and other conditions related to use of alternative

tobacco products should be examined for people, especially men with an education beyond a bachelor's degree.

This study was intended to explore differences in knowledge, beliefs about smoking in general, and opinions about smoking in the workplace among people who smoke and people who do not smoke. If you are able to gain a better understanding of the differences in beliefs and knowledge of smoking behavior among smokers and nonsmokers, it provides a foundation for a dialogue to address changes that affect both parties as individuals making healthy choices and employees of hospitals.

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Appendix A: Smoking in the Workplace Questionnaire

## Smoking in the Workplace Questionnaire

This questionnaire allows you to give your opinion about smoking and smoking in the workplace. Your honest responses are anonymous and will not affect your job. Please circle the response that best represents your opinion. It should take approximately 15 minutes to complete. Your assistance is appreciated.

1. What is your age? \_\_\_\_\_
2. What is your gender?
  - a. Female
  - b. Male
3. Are you a parent?
  - a. Yes
  - b. No
4. What is the highest level of education you have attained?
  - a. did not graduate high school
  - b. GED
  - c. High School graduate
  - d. Some college or trade school
  - e. Trade School graduate
  - f. College graduate
  - g. Post-baccalaureate or other professional certification
5. What is your race?
  - a. Native Alaskan/American
  - b. Asian/Pacific Islander
  - c. Black
  - d. Hispanic
  - e. White
  - f. Other
6. What is your working category?
  - a. Laborer
  - b. Management
  - c. Clerical
  - d. Technical/Skilled
  - e. Contract
  - f. Other please specify \_\_\_\_\_
7. How many hours do you work per week?
  - a. Less than 10
  - b. 10-20 hours
  - c. 21-30 hours
  - d. 31-40 hours
  - e. 40+ hours
8. How would you identify your current smoking status?
  - a. cigarette smoker
  - b. cigar or pipe
  - c. smokeless user (chew dip or snuff)
  - d. never smoked
  - e. ex-smoker
9. If you smoke, how old were you when you had your first tobacco product (cigarette, cigar, pipe, or smokeless tobacco)?
  - a. less than 12
  - b. 12-16
  - c. 17-20
  - d. don't know
  - e. don't smoke
  - f. other
10. If you smoke, how much do you smoke?
  - a. 2 or more packs per day
  - b. between 1 and 2 packs per day
  - c. less than a pack per day
  - d. less than a pack per week
  - e. don't smoke

11. If you smoke, have you tried to quit smoking and been unable?  
a. Yes                                  b. No
12. How often do you try to quit smoking each year?  
a. Don't smoke                          c. 2-3 times  
b. Once a year                              d. 4 or more
13. If you do not smoke do you ask people to stop smoking when you are in the area?  
a. Yes    b. No

Please circle the appropriate number to show how strongly you agree or disagree with the following statements.

	Strongly Agree	Agree	Disagree	Strongly Disagree
14. Nicotine is a strong addictive substance	1	2	3	4
15. Tobacco use increases the risk of many diseases such as lung cancer and heart disease.	1	2	3	4
16. Smoking helps reduce stress or anxiety	1	2	3	4
17. Tobacco use costs the American Public \$100 billion per year in healthcare dollars.	1	2	3	4
18. Laws regarding smoking behavior should be strictly enforced	1	2	3	4
19. It doesn't bother me if my friends smoke.	1	2	3	4
20. Nicotine in cigarettes makes it difficult for people to quit	1	2	3	4
21 Smoking is a personal matter and should not be regulated for adults	1	2	3	4
22. I don't mind being in a room with others that smoke	1	2	3	4
23. Tobacco use is higher among people who are poor	1	2	3	4

24. Tobacco advertisements influences a person's use of tobacco products	1	2	3	4
25. Exercise and sports help get all the tar	1	2	3	4
26. Smoking is not as harmful as you hear	1	2	3	4
27. The tobacco companies should be responsible who are addicted to tobacco.	1	2	3	4
28. The tobacco companies' promotional activities such as free clothing influence people's choice of tobacco products	1	2	3	4
29. Smoking helps control your weight.	1	2	3	4
30. The effects of second hand smoke are exaggerated	1	2	3	4
31. People who break smoking laws should be fined ( in the same manner we enforce speeding)	1	2	3	4
32. The tax placed on smokers when they buy cigarettes is unfair	1	2	3	4
33. Smoking should be allowed in conference rooms at work	1	2	3	4
34. Smoking should be allowed in rest rooms at work	1	2	3	4
35. Smoking should be allowed in lunchroom at work	1	2	3	4
36. Smoking should be allowed in company vehicles	1	2	3	4
37. Smoking should be allowed in hallways at work	1	2	3	4
38. Smoking should be allowed outside the building during lunch hours at lunchtime	1	2	3	4

**Appendix B: Human Subjects Committee Approval**



July 2, 1999

Dr. Carolyn Mikanowicz, Associate Professor, for  
Nicholas V. Cascarelli  
Department of Health Professions  
CAMPUS

RE: Human Subjects Research Protocol #65-99

Dear Dr. Mikanowicz and Mr. Cascarelli:

The Human Subjects Research Committee has reviewed your protocol, HSRC#65-99, "Differences Among Smokers, Former Smokers, and Non-smokers: A Work Site Investigation," and determined that it is exempt from review based on DHHS Category 4 subject to the following condition:

- (1) The researcher should provide the Committee with written consent from each of the sites he will distribute the questionnaire.

Any changes in your research activity should be promptly reported to the Human Subjects Research Committee and may not be initiated without HSRC approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the Human Subjects Research Committee. Best wishes in the conduct of your study.

Sincerely,

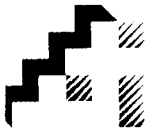
Eric Lewandowski  
Administrative Co-chair  
Human Subjects Research Committee

cc:ECL

c: Mr. Joseph Mistovich, Chair  
Department of Health Professions



Appendix C: Letter of Permission from Employer



HUMILITY OF MARY  
Health Partners

December 15, 1999

Nicholas Cascarelli  
Department of Health Professions  
Youngstown State University  
Youngstown, Ohio 44555

RE: IRB Approval 99-038

Dear Mr. Cascarelli,

At the Institutional Review Board meeting held on December 15, 1999, your project entitled, ***"Differences Among Smokers, Former Smokers and Non Smokers, A Worksite Investigation"*** was reviewed. The IRB committee has concurred with the Chairman's decision of expedited approval of the protocol and the informed consent document for one year, expiring on December 15, 2000. **The approval number for the protocol is 99-038 and should be used in all future correspondence.**

According to federal guidelines, all human research projects are approved for one year. If the project lasts for more than one year, an annual progress report must be submitted to the IRB with a request for reapproval.

If you have any questions, please do not hesitate to contact me at (330) 480-3341.

Sincerely,

Chatrchai Watanakunakorn, M.D.  
Chairperson  
Institutional Review Board

CW/mdc

**St. Elizabeth Health Center**

1044 Belmont Avenue / Youngstown, Ohio 44501 / (330)746-7211

MEMBER OF CATHOLIC HEALTHCARE PARTNERS



Appendix D: Letter of Consent

## Letter Of Consent

Dear participant,

We are conducting a study to examine beliefs about smoking and smoking in the workplace. In this study you will be asked to answer a 38-item questionnaire. Your participation should take about 15 minutes. There are no risks to you as all the responses you make will be strictly anonymous. So when the results are recorded, no one will be able to identify you.

Your participation in this study is totally voluntary and you may withdraw at anytime with no negative consequences. If you wish to withdraw, simply hand in the questionnaire.

If you have any questions regarding the study, you may feel free to contact:

Carolyn Mikanowicz Ph.D.  
Professor, Dept. of Health Professions  
Youngstown State University  
Youngstown, Ohio 44555  
(330) 742-3658

or Nicholas Cascarelli  
Dept. of Health Professions  
Youngstown State University  
Youngstown, Ohio 44555  
(330) 742-3327  
(330) 372-6000 x146

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I understand the study described above. I am at least 18 years old and agree to participate.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date