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Smoking Behavior in Men Hospitalized with Cardiovascular Disease In Korea

by

Min Sohn

DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Nursing
in the

GRADUATE DIVISION

of the

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO



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By

Min Sohn

Dedication

This dissertation is dedicated to my father, Hong-Un Sohn, my mother Sun-Keum Choi, and my dear grandmother, U-Sun Kim.

Acknowledgements

My doctoral work would not have been possible without the encouragement and great support of the following people.

First of all, I give thanks to my parents who allowed me to study in the U.S. and who give me endless love and support. My mother is the most amazing woman in my life, and she has taken care of me all of my life and every step of the way on my journey here in the U.S. My two sisters, Min-Kang, and Kang, and my brother, Min-Chul also are a great source of great support and love. I will not forget how much their letters and numerous email and phone calls made me happy and gave me comfort. My dear grandmother passed away in the summer of 2003 just after my qualifying exam. I am very sorry that she is not here physically at this moment, but I believe she has always been with me. I also should mention my pretty, little niece, Ye-Jin and brother in law, Chong-Chul and thank them for their love and concern about me.

Dr. Erika S. Froelicher, my dissertation chair, my advisor, excellent teacher, my boss and my academic mom, has been the second most amazing woman in my life. Since I first met her 4 years ago, she has continuously shown me her talent, passion, and has cared for me. I recognize that I am a lucky human because I have two moms in my life; one is my mother, and the other is Erika. She has been a problem solver for many of my crises and she showed such great love and support I could never have imagined. I learned all I should know about research, teaching, friendship and respect among colleagues, being a responsible scientist and love for students as a mentor. I love her more than I can say in words.

I would also like to thank my dissertation committee members, Dr. Nancy Stotts, Dr. Neal Benowitz, and Dr. Dianne Christopherson. I was lucky to have these great scientists as my committee members for my doctoral dissertation. My work could not be accomplished without their careful directions, scientific advice and sincere support. I also thank to Dr. Steven Paul for statistical consulting.

I want to thank the following persons and institutions for their help for my study: The 97 men who took part in this study; the Cardiology Department of Hanyang University Medical Center (Seoul, Korea) with Dr. Kyung Soo Kim and Ms. Ok Hee Baek; the Cardiovascular Hospital of Yonsei University Medical Center (Seoul, Korea) with Dr. Sung Soon Kim, Dr. Yang Soo Jang and Ms. Mi Sook Ahn; and Ms. Hye-Un Byun for her translation works.

My best friend, Seoyoung Seo should be mentioned here. My academic sisters, Ruth, Wen-Wen and Neelam, are my first friends and colleagues since I came to the U.S.

I also thank to Hanyang University (Seoul, Korea), P.E.O. International and Women Health Care Executives (WHCE) of Northern California for their kind and generous support during my doctoral program. The study was supported from Century Club Fund and Graduate Research Fund, University of California San Francisco. Thank you for this generosity.

Smoking Behavior in Men Hospitalized with Cardiovascular Diseases in Korea

Min Sohn, RN, MS, MPH

University of California, San Francisco, 2004

Abstract

Introduction: Korean men have the highest smoking rate in the world. CVD is a significant tobacco related disease and their second greatest cause of death.

Purpose: To describe (1) demographics, hospitalization, CVD, and psychosocial risk factors, smoking behavior, knowledge, attitudes and health beliefs about smoking, and needs for smoking cessation interventions; and 2) predictors of nicotine addiction, violation of hospital smoking ban and confidence to quit smoking.

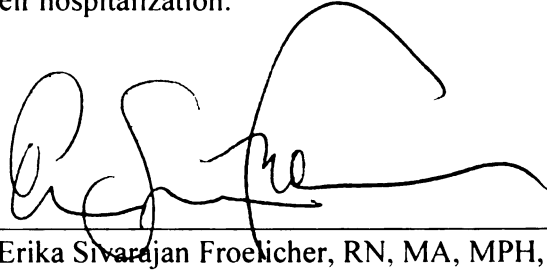
Designs and Methods: A cross sectional study with a convenient sample, 97 men from two hospitals in Seoul, Korea. Data were collected with a structured questionnaire and medical record abstraction from January to August of 2004.

Findings: The mean age of the men was 54.1 (\pm 9.6) years. Most graduated from high school or more (74.2%), were married (85.6%), and employed (77.3%). Sixty-five percent were highly addicted to nicotine, and lower education (OR: 3.26, 95% CI: 1.03, 10.39), starting smoking at early age (OR: 3.30, 95% CI: 1.14, 9.50) and smoking more than 20 cigarettes per day (OR: 7.27, 95% CI: 1.48, 35.83) were associated with nicotine addiction. Twenty-two percent violated hospital smoking ban and these men were more likely not to intend to quit smoking (OR: 0.09, 95% CI: 0.03, 0.31). Most of the men (74.4%) had high confidence to quit smoking. Being married (OR: 5.54, 95% CI: 1.33, 23.08), having a higher score of CAGE (OR: 3.25, 95% CI: 1.20, 8.80), and starting smoking at earlier age (OR: 2.96, 95% CI: 1.14, 7.68) were associated with confidence to

quit smoking. Most were knowledgeable about the benefits of quitting smoking; intended to quit smoking after discharge (92.8%); and wanted to quit by themselves (87.8%). Half of the men (50.5%) were willing to participate in a smoking cessation program if available during their hospitalization.

Conclusions: This is the first study to address smoking behavior in this unique population. These men were aware of the health benefits of quitting smoking, and were motivated to quit smoking. Korean nurses have an opportunity to offer smoking cessation interventions to their patients during their hospitalization.

Approved by Dissertation Chair:



Erika Sivarajan Froenicher, RN, MA, MPH, PhD

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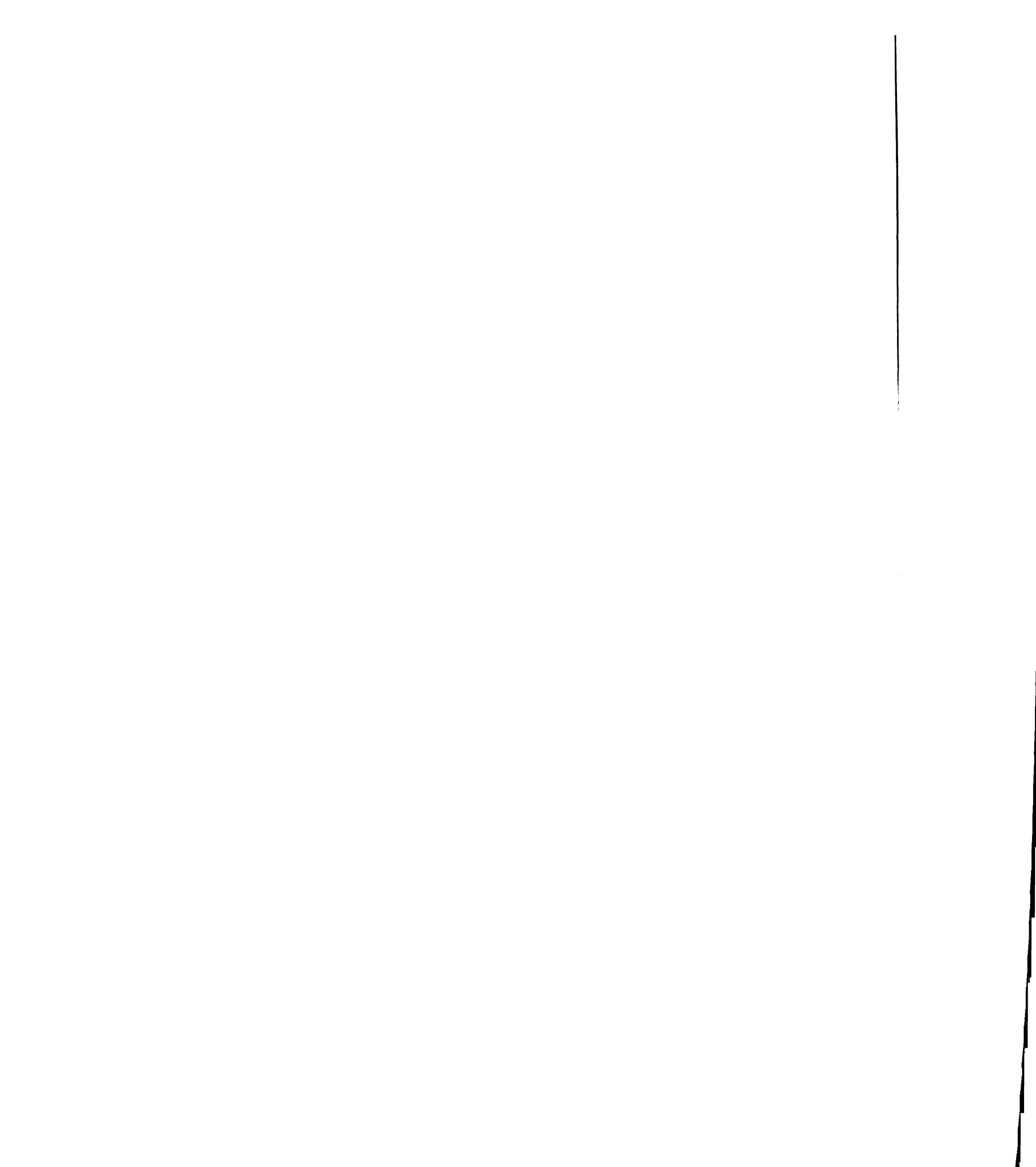
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Chapter 1
Introduction

The World Health Organization (WHO)¹ currently estimates that, globally, four million deaths are caused each year by use of tobacco and by 2020, tobacco use will become the single largest cause of health problems worldwide, leading to an estimated 8.4 million deaths per year. Although the smoking rate in Korea has declined during the last decade, in 2003, the smoking prevalence was still high with a rate of 57% among men and 4% among women.² This level of smoking prevalence in Korean men ranks the highest in the world and Korea is therefore one of the nations most highly affected by this global, public health problem.

However, there are few studies focusing on tobacco control efforts among patients who have smoking related diseases in Korea. Cardiovascular disease (CVD) is a well known tobacco related disease, and it is clear that smoking has adverse effects on prognosis of CVD, outcomes of surgical and medical interventions as well as the development of CVD.³ Using multiple search methodologies, we found no research focused on the smoking behavior of Korean patients with CVD, particularly hospitalized patients with CVD. According to the Korean national data,⁴ a quarter of all patients who visit outpatient clinics or emergency rooms due to CVD are hospitalized. A large number of CVD patients currently occupy Korean hospitals and need professional education and counseling to help them quit smoking. However, basic information on Korean CVD

patients who smoke is not available.

Significance of this Study

This study will provide important descriptive information to nurses and other health care providers. Also, the study will identify key interests, concerns and preferences needed as a first step toward building a smoking cessation and relapse prevention intervention. Additionally, this study has the potential to inform the planning of culturally appropriate smoking cessation interventions in the Korean hospital setting.

Purposes of Chapters

This study aims to describe all the related information about smoking behavior in men hospitalized with CVD in Korea. This dissertation includes 5 Chapters including introduction, three papers and the executive summary of the study findings. Chapter 2 reviews the issues related to tobacco addiction including nicotine pharmacology, clinical features of nicotine addiction, and its treatment. Chapter 3 describes their demographics, cardiovascular risk factors, psychosocial risk factors, hospitalization factors, and their smoking behavior. Chapter 4 explores the knowledge, attitudes and health beliefs about the benefits of quitting smoking and describes perceived needs for future smoking cessation interventions. Chapter 5 provides executive summary of Chapter 2, 3, and 4.

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Chapter 2

Tobacco Use and Dependence

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Objective:

addiction.

Data Source:

Conclusion:

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Implication

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Abstract

Objectives: To review tobacco use and dependence including nicotine pharmacology and addiction, and pharmacologic treatment.

Data Sources: Professional journals, books, government publication.

Conclusion: Smoking is addictive and a major health problem. Habitual nicotine use is central to sustaining smoking dependence. This paper provides the necessary basis for understanding nicotine addiction and pharmacological therapies.

Implications for Nursing Practice: Nurses' knowledge about nicotine addiction is important in helping patients to quit smoking.

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Introduction

Cigarette smoking has been implicated as a risk factor for a variety of conditions and illnesses including cancer, coronary heart disease, stroke, peripheral vascular disease, and chronic lung diseases.^{1 2} Smoking continues to be the leading cause of preventable death in the United States, and resulted in approximately 442,000 premature deaths annually between 1995 and 1999.³ Cigarette smoking is responsible for approximately one in five deaths in the United States.^{4 5}

Tobacco use is a primary cause of many cancers such as lung, oral, pancreatic, uterine, cervical, kidney, and bladder cancer.⁶ Tobacco use accounts for more than 29% of all cancer deaths in the United States.⁷ The lung is the leading cancer site for both men and women and is responsible for 32% of all cancer deaths in men and 25% in women.⁶

In addition to the health consequences, there is also a sizeable economic burden in the United States associated with cigarette smoking. According to the Centers for Disease Control, the average annual mortality-related productivity losses attributable to smoking for adults were \$81.9 billion between 1995-1999. In 1998, smoking-attributable personal healthcare medical expenditures were \$75.5 billion.⁸

Despite the known adverse effects of cigarette smoking, millions of Americans are addicted to nicotine and continue to smoke. While a sizable number of people quit smoking each year in the US, about an equal number commence smoking, hence the prevalence has remained almost unchanged.⁹ In 1964, the Report of the Advisory Committee to the Surgeon General first referred to tobacco use as “habituating.”¹⁰ Twenty-two years later, in 1988, the Surgeon General’s report on the health

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consequences of smoking definitively concluded that cigarettes and other tobacco products are addictive and nicotine causes the “addiction.”¹¹

The purpose of this paper is to review the issues related to tobacco addiction including nicotine pharmacology, clinical features of nicotine addiction, and its treatment. This paper will discuss: (1) the definition of smoking as an addiction; (2) the pharmacokinetics and pharmacodynamics of nicotine; (3) nicotine dependence; and (4) treatment of nicotine dependence. For a detailed discussion of the nurses’ role in smoking cessation intervention counseling, the reader is referred to the paper in this issue by Wewers, as well as her website.¹² The implications and significance of the findings for nursing practice and education will also be discussed.

There are a number of tobacco products such as cigarettes, cigars, chewing tobacco, oral and nasal snuff, and pipe tobacco. Of these, this paper will focus primarily on cigarette smoking, because cigarette smoking is the most widely chosen mode of tobacco consumption and most of the research the authors consulted relates to cigarette smoking.

Definition of Nicotine as an Addictive Drug

The terms “drug addiction” and “drug dependence” are widely considered scientifically synonymous.¹¹ “Drug dependence” has been used as a technical term in the medical literature, while the term “drug addiction” has been used by the National Institute on Drug Abuse (NIDA) to provide a more general level of information to the public.¹¹ Both terms describe similar neurochemical and behavioral processes¹¹ and also imply similar levels of loss of control of drug use.⁹ However, the term “drug habit” is clearly distinguished from drug addiction or dependence. Drug habit is thought to be a

psychological dependence rather than a physical dependence and drug habit is not thought to create the same damage to society as drug abuse.⁹ In 1988, the Surgeon General's Report on nicotine addiction developed criteria for drug dependence based on concepts presented by the World Health Organization (WHO), NIDA, and the American Psychiatric Association (APA). These documents provide the supporting evidence that tobacco use is addictive and that nicotine is the active pharmacological agent in tobacco causing the addictive behavior. The evidence includes primary and secondary criteria. The detailed criteria¹¹ are presented in Table 1. The primary criteria are sufficient to define drug dependence. The first criterion is "highly controlled or compulsive use," which indicates drug seeking and drug-taking behavior is driven by strong and irresistible urges. This behavior is sometimes referred to as "habitual" behavior. To distinguish drug dependence from habitual behaviors, the following criteria, psychoactive (mood-altering) effect and the occurrence of drug-motivated behavior, are needed. Secondary criteria are exhibited by most cigarette smokers, but they are not universal in smokers.¹³ For example, some people, when faced with concerns about harmful effects or social pressures related to smoking, are able to quit and do not relapse. Some smokers who have quit report the absence of withdrawal symptoms.¹³

Nicotine is not categorized as an illegal drug as are some other addictive drugs. However, nicotine addiction should be considered as a critical issue in the healthcare setting because of the withdrawal symptoms when sudden smoking cessation occurs, such as during admission to a hospital. These withdrawal symptoms can disguise other medical conditions. Thus clinicians, especially nurses, must be aware of the symptoms and signs of withdrawal from nicotine. The pharmacokinetics of nicotine are complex,

and the interested reader is referred to several excellent sources for a more complete treatise on this subject.⁹ In this paper, nicotine dependence, nicotine addiction, tobacco dependence, and tobacco addiction will be used interchangeably.

Pharmacokinetics and Pharmacodynamics of Nicotine

Pharmacokinetics is the study of the absorption, distribution, metabolism and elimination, of a drug within the body.^{11 14} The study of how a drug acts on a living organism is called pharmacodynamics.^{11 14} A brief review follows.

Absorption

Among many different chemical compounds found within the manufactured cigarette, the main source of tobacco addiction is nicotine. Nicotine is a weak base with a pKa (index of ionic dissociation) of 8.0. This means that at pH 8.0, 50 percent of nicotine is ionized and 50 percent is nonionized.¹¹ Nicotine absorption across biological membranes depends on its pH.¹⁵ The pH of smoke from flue-cured tobaccos found in most cigarettes is acidic (pH 5.5 to 6.0).⁹ At this range of pH, the nicotine is almost completely ionized which means that the nicotine is hardly absorbed when the smoke is held in the mouth.¹⁶ However, when tobacco smoke reaches the lung, nicotine is rapidly absorbed because of huge surface of the alveoli in the lung and the higher pH of the fluid in the lung (approximately 7.4)¹¹ compared to the mouth. In contrast to cigarettes, other tobacco products such as pipe tobacco, cigars, and European cigarettes are manufactured with air-cured tobacco. The smoke of these tobacco products is alkaline, (with a pH up to 8.5), and the nicotine in these products is absorbed well through the mouth.⁹ Figure 1 shows the relationship between blood nicotine concentration and the absorption time for

various types of tobacco products. Benowitz⁹ demonstrated blood concentrations of nicotine in cigarette smoking rises most quickly during cigarette smoking and peaks very soon after its completion. Chewing tobacco, snuff, and nicotine gum are buffered to an alkaline pH to facilitate the absorption of nicotine through the mucous membranes. Concentrations of nicotine in the blood rise gradually with the use of smokeless tobacco and tend to reach a plateau after 30 minutes, with the level persisting and declining only slowly over 2 hours or more.

The amount of nicotine intake from one cigarette varies among individuals; depending on the length and number of puffs of a cigarette, the intensity and depth of inhalation, the mixture of air and smoke, and the amount of available smoke.¹⁷ On average, cigarette smokers take in about 1 mg of nicotine per cigarette,⁹ but this can range from 0.3 to 2 mg.¹⁸

An interesting phenomenon related to nicotine intake is the smokers' self-regulation of their intake of nicotine. Smokers change the way they puff,¹⁹ regulating the frequency and intensity of the inhalation based on the available number of cigarettes²⁰ and their chosen brand of cigarettes, to provide a certain amount of nicotine.^{4,21}

As the health hazards of smoking have been increasingly documented, the marketing of "light cigarettes" by the tobacco industry has increased. The industry has marketed light cigarette under the pretext of offering a less harmful product. Yet research has shown that the light cigarette does not offer the promised harm reduction.²¹

Light cigarettes include low-tar, low-nicotine, lower yield, and so on. According to the 1987 National Health Interview Survey, 44% of smokers reported that they had switched to a low-tar cigarette to reduce their health risk.²² One study conducted by

telephone survey reported that 54% of smokers smoked light or ultra-light cigarettes in 1999.²³ However the overall evidence suggests that many smokers compensate when they switched to the light cigarettes by inhaling more tar and nicotine¹ or increasing the number of cigarettes smoked per day²⁴ to achieve the dose previously inhaled with regular cigarettes. The risk of lung cancer is similar when smoking low-tar cigarettes compared to high-tar cigarettes.²⁵ The other significant problem related to the light cigarette is that many smokers of light cigarettes may have chosen to use these brands instead of quitting.²² Assessment of consumer attitudes, as well as epidemiological studies have raised concerns about the health risks of light cigarettes. An ad hoc committee of the President's Cancer Panel, convened in December 1994, concluded that terms such as "light" and "ultra-light" are in fact health claims that mislead consumers.²⁶

Furthermore, several cigarette brands are marketed as less harmful products and are erroneously advertised as "addiction free cigarettes." Examples of such products are "clove cigarettes" and the "American Spirit." Smokers are being encouraged to switch to such products. Increasingly, these products are popular among young smokers, but may be as dangerous as regular cigarettes.²⁷ Health professionals must be aware of such industry tactics in order to correctly inform smokers of the nicotine content in these cigarettes and the addictive properties of the products. For example, clove cigarettes manufactured in Indonesia,²⁸ are believed to be safer than regular cigarettes. In fact this is not true, because clove cigarettes are composed of a mixture of tobacco (60-80%) and ground clove buds (20-40%)²⁹ and thus still possess certain amount of nicotine. According to Malson et al.,²⁸ smoke yields from standardized machine-smoking analysis indicated clove cigarette products delivered more nicotine, carbon monoxide (CO), and

tar than conventional cigarettes. Subjects who smoke clove cigarettes showed that the quantities of nicotine in the products were significant, thus dispelling the promise of a lower addiction potential. It is of interest that clove cigarettes are often sold in health food stores, giving the product additional, but undeserved credibility.³⁰

Distribution

Smoking is “a unique form of systemic drug administration,”⁹ because nicotine is delivered to the pulmonary system rather than to the portal or systemic venous circulations. Pulmonary absorption of cigarette smoke distributes nicotine much more rapidly than any other method of distribution in the human body. Drugs are considered to be most reinforcing when there is a fast delivery to the brain. In animals receiving intravenous (IV) injection of nicotine, it has been shown that nicotine inhaled in tobacco smoke enters the blood almost as fast as after rapid IV injection.¹¹

The fast distribution leads to a substantial arteriovenous difference during cigarette smoking. Arterial levels exceed venous levels by to 6 fold to 10 fold.⁹ The pharmacologic relevance of this observation is that rapid delivery of nicotine results in a more intense pharmacologic response, owing both to higher arterial levels entering the brain and effects occurring more rapidly, before there is adequate time for the development of tolerance.⁹ The rapid effect of cigarette smoke on the brain is a major determinant of the strength of the psychoactive rewards associated with the drug dependence. Nicotine levels in the brain decline between smoking cigarettes, providing some opportunity for resensitization of receptors, so that positive reinforcement can, to some extent, occur with successive cigarettes, despite the development of tolerance. It takes from 10 to 19 seconds for nicotine to pass from the cigarette to the brain.³¹

Metabolism and Elimination

The liver is the primary organ for metabolism of nicotine, although the lung is involved to some extent; ¹⁵ 2% to 35 % of total elimination ³² is conducted through renal excretion, which depends on urinary pH and urine flow. Cotinine and nicotine-N'-oxide are nicotine's primary metabolites. Approximately 70% to 80% of nicotine is metabolized to cotinine, and about 4% to nicotine-N'-oxide.³³

Cotinine is a widely used marker to evaluate smoking status in surveys and treatment studies.³⁴ Cotinine has a much longer half-life than nicotine (average 16h vs. 2h for nicotine), and cotinine levels are on average 15 fold higher than levels of nicotine during regular smoking or nicotine replacement therapy.³⁵ Cotinine can be detected in body fluids such as blood, urine and saliva.¹¹ Since serum cotinine requires venipuncture for sampling, urinary and salivary cotinine have been used more often in practice and research. Urinary cotinine and salivary cotinine are as reliable in the verification of non smoking status as the blood cotinine test.¹¹

Smoking is commonly considered to be a process of intermittent dosing of nicotine, which is rapidly eliminated from the body. However, nicotine has a half-life of 2 hours; nicotine accumulates in the body over 6 to 8 hours (3 to 4 half-lives) of regular smoking, and persists at significant levels overnight.³³ If a person smokes until bedtime, significant nicotine levels persist throughout the night, and this means that nicotine exposure is continuous.¹¹ However, the nicotine plasma level is lowest in the morning when the smoker awakes. According to Heatherton³⁶ this leads to the discomfort of withdrawal unless the person has the first cigarette soon after awakening. Time to the

first cigarette of the day has been found to be an excellent indicator of nicotine dependence.³⁷

Racial/ethnic differences in nicotine metabolism have been observed. In several studies, African-Americans have higher levels of cotinine for the same consumption of cigarettes smoked per day by Caucasians.³⁸ Perez-Stable et al.³⁹ found that African-Americans metabolize cotinine more slowly than do Caucasians. In their study, African-Americans were also shown to inhale 30% more nicotine per cigarette. This may be related to the fact that the majority of African-Americans smoke mentholated cigarettes, whereas relatively few Caucasians smoke this type of cigarette. Menthol cools the airways and might therefore increase the depth and duration of inhalation.

Pharmacodynamics of Nicotine

Pharmacodynamics of nicotine have been studied extensively and it is a complicated topic. Because the purpose of this paper is to provide practical information to nurses that can be used for clinical application, only clinically important aspects are presented. For more detailed information, the reader is referred to Benowitz.⁹

Nicotine is a psychoactive drug and has a number of effects on mood and cognitive function.⁹ Only tobacco containing nicotine is consumed habitually by people over long periods of time.⁹ The pharmacologic actions of nicotine are involved in tobacco addiction in several ways.⁹ Both the positive and negative effects have been reported in tobacco dependence. Smokers report positive effects such as pleasure, arousal, and relaxation.⁹ Smoking may improve attention and reaction time and improve performance on certain tasks.⁹ Smokers may also experience the relief of adverse emotional states, including the reduction of anxiety or stress, relief from hunger and prevention of weight

gain, and relief of symptoms of withdrawal from nicotine.⁹ To what extent the positive rewards of cigarette smoking, that is, enhanced performance and mood after smoking, are caused by the relief of symptoms of abstinence or by an intrinsic enhancement effect of nicotine (or both) is not very clear.⁹ However, both of the effects can be explained by the neurochemical mechanism of nicotine.

Upon entering systemic circulation, nicotine binds to nicotinic cholinergic receptors found throughout the body, including the brain, autonomic ganglia, and neuromuscular junctions, where it produces an agonist effect.⁴⁰ The neuronal nicotinic cholinergic receptors found throughout the brain appear to play a central role in nicotine addiction.⁴¹ Nicotine acts presynaptically to facilitate the release of neurotransmitters such as acetylcholine, norepinephrine, dopamine, beta endorphin, and serotonin-causing behavioral arousal and sympathetic neural activation.^{42 41} For example, enhanced release of dopamine and norepinephrine may be associated with both pleasure and appetite suppression, the latter of which may contribute to lower body weight.⁹ Release of acetylcholine may be associated with improved performance on behavioral task and improvement of memory.⁹ Release of β endorphin may be associated with reduction of anxiety and tension.⁹

Nicotine's effect on these neurotransmitters, which can mimic the pharmacologic effects of many anti-depressants, have been implicated as a major component in the reinforcing effects of cigarette smoking and subsequent development of nicotine addiction.^{41 43 44} The neurotransmitters released by nicotine and their associated behavioral effects are presented in Figure 2.

Nicotine Dependence

Nicotine produces tobacco dependence in several ways. Both a physical dependence including the clinical features of nicotine tolerance and nicotine withdrawal, and psychological and environmental rewards have been described.

Nicotine Tolerance

Prolonged or repeated exposure to nicotine induces neuroadaptation, a phenomenon otherwise known as tolerance.⁴⁵ Tolerance is defined as a state in which, after repeated doses, a given dose of a drug produces less effect than before, or in which increasing doses are required to achieve the effect observed with the first dose.¹⁵ Tolerance to nicotine is manifested by the absence of nausea, dizziness, and other characteristic symptoms despite using substantial amounts of nicotine, or a diminished effect observed with continued use of the same amount of nicotine-containing products.¹³ With neuroadaptation, tolerance develops to the physiologic effects of the substance.⁴⁰ In the case of cigarette smokers, greater and greater amounts of nicotine are required to achieve a physiologic response. Evidence of neuroadaptation in cigarette smokers lies in the fact that smokers progressively increase the number of cigarettes they smoke over a period of several years.⁴¹ After the development of neuroadaptation or tolerance due to chronic nicotine exposure, the absence of nicotine results in subnormal release of dopamine and other neurotransmitters.⁹ This may result in a state of deficient dopamine responses to novel stimuli in general and to a state of malaise and inability to experience pleasure.⁹ Koob⁴⁶ has coined this observation as “hedonic homeostatic dysregulation.” According to Koob, most drug users do not become drug abusers or drug dependent due to the self-regulation. Koob conceptualizes how the regulation failure leads to addiction.

Once a person quits smoking, the body mobilizes enormous amounts of energy to maintain the homeostasis of abstinence. He argued that the first self-regulation failure (even a puff of smoking) can lead to significant emotional distress. This emotional distress can lead to a break down in the system, which is already at the limit of its capability. Hedonic homeostatic dysregulation may explain why even a single slip might easily result in a return to compulsive drug use.⁹

Nicotine Withdrawal

Based on the definition provided by the American Psychiatric Association, a characteristic withdrawal syndrome develops after the abrupt cessation of, or reduction in, the use of nicotine-containing products following a prolonged period (at least several weeks) of daily use.¹³ Cessation of nicotine use produces well-defined withdrawal symptoms. According to the criteria of DSM IV (Table 2), the withdrawal syndrome includes four or more of the following: dysphoric or depressed mood; insomnia; irritability, frustration, or anger; anxiety; difficulty concentrating; restlessness or impatience; decreased heart rate; and increased appetite or weight gain.¹³ The withdrawal symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.¹³ The symptoms must be differentiated from those present due to a general medical condition, and are not better accounted for by another mental disorder.¹³ Smokers who suddenly abstain from smoking either purposefully or inadvertently begin to experience signs and symptoms of withdrawal within hours, with the symptoms reaching maximal intensity in 24-48 hours, then gradually decreasing over a two week period.⁴² It has been reported that withdrawal symptoms occur more frequently from smoking cigarettes than from other addictive drugs such as alcohol,

cocaine, and marijuana, although the severity of symptoms are much less than those for other drugs.⁴⁷ Neuroadaptation is also responsible for the symptoms of withdrawal that occur when exposure to nicotine suddenly ceases. Because the central nervous system has become accustomed to the nicotine mediated release of neurotransmitters, a sudden absence of nicotine, such as may occur when a patient is hospitalized in a smoke-free institution, causes an abrupt decrease in circulating neurotransmitters. The lack of neurotransmitters is responsible in part for the physical symptoms of nicotine withdrawal.

Some studies have reported possible differences in withdrawal symptoms between genders. A depressive effect is more likely to be seen in women than men.⁴⁸ Women who quit smoking are more likely to report cigarette cravings than men and are less likely to report physiological symptoms of withdrawal compared to men.⁴⁹

Other Psychological and Environmental Rewarding Effects of Nicotine Dependence

Benowitz⁹ addressed the environmental conditioning as well as pharmacologic actions involved in nicotine dependence. All drug-taking behavior is learned, a result of conditioning.⁹ In addition to the positive and negative effects of nicotine which was already discussed in the previous session of pharmacodynamics of nicotine, the smoker begins to associate specific moods, situations, or environmental factors with the rewarding effects of the drug.⁹ People often smoke cigarettes in specific situations, such as after a meal, or drinking with friends who smoke in a bar. The habit of smoking after a meal has been controversial as to the possible physiological explanation for the behavior in addition to psychological rewards. Several physiological theories⁵⁰ have been tested to explain smoking after a meal, thus far no clear explanation has been found. These environmental situations become powerful cues for the urge to smoke. Although

conditioning becomes an important element of nicotine dependence, conditioning develops only because of a pairing of the pharmacologic actions of nicotine with behaviors. Conditioning loses its power without the presence of an active drug. When one provides behavioral therapy for nicotine dependence, conditioning should be considered as a major component of the program since conditioning is one of the main reasons for relapse after a period of cessation.

Assessing Nicotine Dependence

The lifetime prevalence of nicotine dependence in the general population is estimated to be 20%. In the United States, between 50% and 80% of individuals who currently smoke are nicotine dependent.¹³ Therefore, nicotine dependence needs to be assessed in all patients. The six-item Fagerstroem Questionnaire for Nicotine Dependence (FTND)³⁶ is a commonly used instrument to evaluate the severity of nicotine addiction. Total score ranges from 0 to 10 and total score of greater than 7 indicates nicotine dependence.⁵¹ The questions and scoring system are presented in Table 3. Patients can administer this self-test to identify their degree of dependence. The scores can range from 0 to 10. Clinicians who have many demands on their time can consider using 2 of the Fagerstroem Questions. It has been shown that highly addicted smokers use nicotine to relieve or to avoid withdrawal symptoms when they wake up in the morning, and have a difficult time refraining from smoking when placed in a situation where cigarette use is restricted.¹³ Therefore, asking two questions: (1) how soon after you wake up do you smoke your first cigarette; and (2) do you find it difficult to refrain from smoking in places where it is forbidden, would be very informative.

According to Rigotti,⁵² patients who are craving cigarettes will require special attention with respect to smoking cessation intervention during hospitalization, since these patients are at the highest risk for relapse after discharge. Rigotti and colleagues⁵² conducted an observational study to determine the proportion of smokers who were non-compliant with a hospital non-smoking policy, to identify the characteristics of patients who smoked during hospitalization, and to determine whether tobacco abstinence in the hospital predicts smoking cessation after discharge. The authors found that one quarter of the participants in the study smoked while they were hospitalized. Of those participants, the presence of cigarette craving and restlessness were independently associated with smoking while hospitalized. The authors also concluded that abstaining from tobacco while hospitalized dramatically improved a smoker's chance of permanent cessation after discharge. Some of the most notable findings of the study were that patients who craved cigarettes were five times more likely to continue smoking after discharge, and abstaining from tobacco use while hospitalized was a strong independent predictor of continued abstinence after discharge.⁵³ This study was significant because it identified a potential benefit for interventions such as nicotine replacement therapy for decreasing nicotine cravings and supporting smoking cessation and permanent abstinence in hospitalized smokers. This finding is consistent with the latest recommendations by Fiore et al.⁵⁴

Treatment of Nicotine Dependence

To maximize the effect of smoking cessation interventions, pharmacological interventions should be combined with education, counseling, and the support of health care providers.⁵⁴ However, the focus of this paper is to enhance the nurse's understanding

of dependence and the pharmacological treatment of dependence, which is very underused.⁵⁵

Nicotine Replacement Therapy (NRT)

Helping smokers quit is a major challenge because of the addictive nature of tobacco.⁵⁵ Although pharmacologic therapies are recommended for smoking intervention, these are best combined with behavioral therapies to maximize the effect of the intervention. The current clinical practice guideline⁵⁴ on treating tobacco and dependence provides detailed information about the efficacy of each agent for smoking cessation. In the guideline the first (four types of nicotine products and Bupropion SR) and second-line pharmacotherapies (Clonidine and Nortriptyline) are presented. Currently on the market are four types of nicotine products: nicotine gum, a nicotine inhaler, nicotine nasal spray, and the nicotine patch. Bupropion SR is recommended as a non-nicotine alternative when the patient quits smoking.⁵⁴

Once the signs and symptoms of nicotine withdrawal have been recognized, nicotine replacement therapy (NRT) should be initiated. Indications for the use of NRT are given in Table 4. The U.S. Department of Health and Human Services recommends that all patients attempting to quit smoking be encouraged to use pharmacotherapies such as NRT, and that long-term pharmacotherapy is an effective strategy for reducing the likelihood of relapse.⁵⁶ Hajek et al.⁵⁷ conducted a randomized trial to compare four methods of NRT. Overall the findings indicate that there is no significant difference with respect to withdrawal discomfort, urges to smoke, or rates of abstinence between the four methods of NRT compared in this study, though compliance seemed to be highest with the nicotine transdermal patch. The most likely explanation for the highest compliance

with the transdermal patch is that this method of administration requires the least behavioral demand. Clinicians need to be aware that patients may have reservations about using a NRT product.

Mahrer-Imhof et al⁵⁵ recently completed a study of a hospital-based intervention in women and reported anecdotally that a high proportion of subjects refused NRT, stating “they did not need it” or they did not want to get “hooked on NRT.” However, nicotine contained in NRT is more slowly absorbed than by smoking, which rarely leads to psychoactive effects.¹¹ Therefore, nurses need to take the time to teach patients about the benefits of NRT and help clarify the myths held by smokers.

Non-Nicotine Therapies

Bupropion SR is one of the first-line pharmacotherapies presented in the clinical guideline.⁵⁴ Favorable effects from Bupropion SR (a non nicotine agent and anti-depressant), have been recently reported by Prochaska⁵⁸ and Covey et al.⁵⁹ Bupropion (Zyban, Wellbutrin SR [GlaxoWellcome, Research Triangle Park, NC]) is an oral medication in tablet form. This pharmacologic aid for smoking cessation has been used for many years to treat depression. The exact mechanism that promotes smoking cessation is unknown. Bupropion does, however, affect levels of dopamine and norepinephrine. It appears to result in cessation rates similar to those with NRT at the completion of the 7- to-12 week treatment period. Bupropon is contraindicated in patients at high risk for seizure due to previous head trauma, central nervous system tumor, anorexia nervosa, bulimia, previous seizure, or concomitant use with another medication that lowers the seizure threshold. The most common side effects are insomnia, dry mouth and anxiety and nervousness.^{60 61}

Nursing Implications

Tobacco dependence is identified as a legitimate medical diagnosis in ICD-9-CM, and calls for the documentation of smoking as a medical condition with appropriate diagnostic and billing codes.⁵⁴ Although smoking is sometimes considered (misunderstood) to be a private and personal choice on the part of the individual, it needs to be emphasized that since smoking is identified as a legitimate medical diagnosis in the number of professional documents, counseling is an expected part of nursing practice. Furthermore, due to the addictive nature of nicotine, patients who are addicted are often not able to give up smoking, despite a sincere desire to do so. Nurses in general believe that patients who smoke are not concerned about the health consequences of smoking and do not have a strong desire to stop smoking. Furthermore, nurses believe that if they do advise a patient to stop smoking, the likelihood of the patient actually stopping is not very high.⁶²

One interesting example shows how much the misconceptions of health care providers do not meet the needs of public. A public opinion poll conducted by Newsweek in 1999⁶³ asked smokers if they “wanted to quit or cut down” on their smoking; 69% of men and 68 % of women polled answered “yes.” This poll clearly contradicts the misconception of some nurses that smokers are not interested in quitting.

Conclusion

According to Benowitz⁹, nicotine is central to maintaining tobacco use. Understanding how nicotine sustains smoking dependence provides a necessary basis for developing optimal smoking cessation therapy. This paper provides essential information about nicotine addiction and suggests several ways to assist patients with smoking

cessation and relapse prevention such as by treating patients with NRT and offering all patients evidence-based smoking cessation recommendations.

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Table 1.1 The Surgeon General's Report: Criteria for Drug Dependence

<p>Primary Criteria</p> <ul style="list-style-type: none">- Highly controlled or compulsive use- Psychoactive effects- Drug-reinforced behavior <p>Additional Criteria</p> <ul style="list-style-type: none">- Addictive behavior often involves:<ul style="list-style-type: none">o Stereotypic patterns of useo Use despite harmful effectso Relapse following abstinenceo Recurrent drug cravings- Dependence-producing drugs often produce:<ul style="list-style-type: none">o Toleranceo Physical dependenceo Pleasant (euphoriant) effects
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From US Department of Health and Human Services, Public Health Service: The Health Consequences of Smoking: Nicotine Addiction. A Report of the Surgeon General. DHHS (CDC) Publication No.88-8406. Washington, DC, Government Printing Office, 1988. With permission.

Table 1.2 DSM IV. Diagnostic Criteria for Nicotine Withdrawal

<p>A. Daily use of nicotine for at least several weeks</p> <p>B. Abrupt cessation of nicotine use, or reduction in the amount of nicotine used, followed within 24 hours by four (or more) of the following signs:</p> <ul style="list-style-type: none">(1) dysphoric or depressed mood(2) insomnia(3) irritability, frustration, or anger(4) anxiety(5) difficulty concentrating(6) restlessness(7) decreased heart rate(8) increased appetite or weight gain <p>C. The symptoms in Criteria B cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.</p> <p>D. The symptoms are not due to a general medical condition and are not better accounted for by another mental disorder.</p>
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From American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association, 1994. With permission.

Table 1.3 Items and scoring for Fagerstroem Test for Nicotine Dependence (FTND)

Question	Answers	Points
1. How soon after you wake up do you smoke your first cigarette?	Within 5 minutes	3
	6-30 minutes	2
	31-60 minutes	1
	After 60 minutes	0
2. Do you find it difficult to refrain from smoking in places where it is forbidden e.g., in church, at the library, in the cinema, etc.?	Yes	1
	No	0
3. Which cigarette would you hate most to give up?	The first one in the morning	1
	All others	0
4. How many cigarettes/day do you smoke?	10 or less	0
	11-20	1
	21-30	2
	31 or more	3
5. Do you smoke more frequently during the first hours after waking than during the rest of the day?	Yes	1
	No	0
6. Do you smoke if you are so ill that you are in bed most of the day?	Yes	1
	No	0
Total score ranges from 0 to 10.		
Total score of greater than 7 indicates nicotine dependence.		

From Heatherton T, Kozlowski L, Frecker R, Fagerstroem K. The Fagerstroem Test for Nicotine Dependence: a revision of the Fagerstroem Tolerance Questionnaire. *British Journal of Addiction* 1991;86:1119-27. With permission.

Table 1.4 Criteria for recommending NRT use*

<ul style="list-style-type: none">• Smokes > 25 cigarettes per day• When asked: “How soon after you wake up do you smoke the first cigarette?”[#] If patients answers within 1 hour on the question• When asked “Do you smoke on days that you are so ill that you are in bed most of the day?”[#] If patient answers “yes” to the question.• Self-reported “very sever” withdrawal symptoms• Relapse after initiatively smoking cessation
At least 1 criterion needs to be met. [#] questions from Fagerstroem instrument in Table 2.

Modified from: Mahrer-Imhof R, Sivarajan Froelicher E, Li W, Parker K, Benowitz N. Women's Initiative for Nonsmoking (WINS V): Under-use of nicotine replacement therapy. *Heart & Lung* 2002; 31:368-73. Permission requested.⁵⁵

Figure 1.1 Blood concentration of nicotine by four types of tobacco use

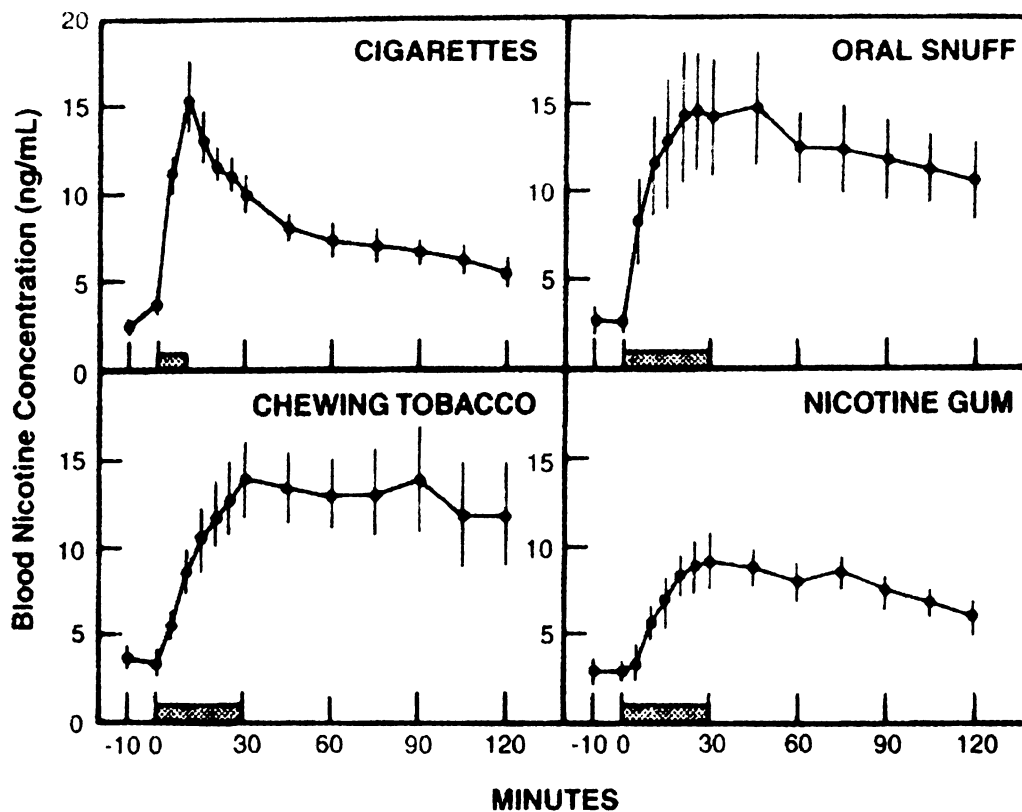


Figure 2. Mean (\pm SEM) blood concentrations of nicotine in 10 subjects who smoked cigarettes for 9 minutes ($1\frac{1}{3}$ cigarettes), used oral snuff (2.5 g), used chewing tobacco (mean, 7.9 g), and chewed nicotine gum (two 2-mg pieces). Shaded bars above the time axis indicate the period of exposure to tobacco or nicotine gum. (From Benowitz NL, Porchet H, Sheiner L, et al: Nicotine absorption and cardiovascular effects with smokeless tobacco use: Comparison with cigarettes and nicotine gum. Clin Pharmacol Ther 44:23, 1988; with permission.)

Figure 1.2 Neurochemical effects of nicotine.

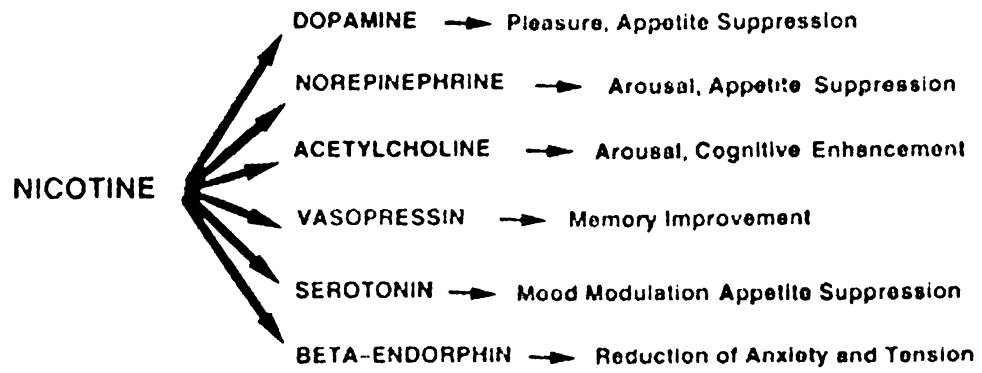


Figure 1. Neurochemical effects of nicotine.

From Benowitz N. Nicotine Addiction. *Primary Care* 1999; 26(3):611-31. With permission.

Chapter 3

Smoking Behavior in Men Hospitalized with Cardiovascular Disease in Korea

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Abstract

Introduction: Korean men have the highest smoking rate in the world. Cardiovascular disease (CVD) is the one of the most significant tobacco related diseases and CVD is the second greatest cause of death in Korean men. Korean male patients hospitalized with CVD have an important opportunity to quit smoking while they are under hospital smoking ban.

Objectives: Objectives of this study are to 1) describe aspects of demographics, hospitalization factors, cardiovascular (CV) risk factors, psychosocial risk factors, and smoking behavior among Korean men hospitalized with CVD in Korea; and 2) identify factors that are associated with levels of nicotine addiction and violation of hospital smoking ban.

Methods: This is a cross sectional study. For data collection, a structured questionnaire was administered using a guided interview and medical record abstraction.

Results: The study sample included 97 men with a mean age of 54.1 (\pm 9.6) years. Most of the men (74.2%) had graduated from high school or more; 85.6% were married; and 77.3% were fully employed. The median category of family income for these men was 2,500 – 2,999 thousand won (\$ 2,080 - \$2,499) per month. The most common CVD diagnosis of the men at admission was myocardial infarction (23.7%). The proportion of men who reported signs indicative of alcoholism was very high (53.5%). Sixty five percent of men were addicted to nicotine as determined by time to first cigarette in the morning, and lower education (OR: 3.26, 95% CI: 1.03, 10.39), starting smoking at early age (OR: 3.30, 95% CI: 1.14, 9.50) and smoking more cigarettes per day (OR: 7.27, 95% CI: 1.48, 35.83) are statistically significant independent predictors of level of addiction in

a model evaluated with 6 variables. Twenty-two percent of men smoked during hospitalization, and this behavior was significantly associated with their intention to quit smoking (OR: 0.09, 95% CI: 0.03, 0.31).

Conclusions: This is the first study to address smoking behavior in men hospitalized with cardiovascular disease in Korea. Although they were under hospital smoking ban, about one-fifth of subjects smoked during hospitalization, suggesting that these men might have special needs for help to stop smoking. In addition, a high proportion of the men who were at risk of excessive alcohol use suggest that an intervention for dual addiction -- nicotine and alcohol -- should be considered. Health care providers should provide a smoking cessation program for this population. For that, proper education and training for Korean health care providers is needed.

Key words: Smoking, CVD, Korean men, violation of hospital smoking ban, level of nicotine addiction, hospitalization, alcohol use, dual addiction.

Introduction

The World Health Organization (WHO)¹ currently estimates that, globally, four million deaths are caused each year by use of tobacco and by 2020, tobacco use will become the single largest cause of health problems worldwide, leading to an estimated 8.4 million deaths per year. Although the smoking rate in Korea has declined during the last decade, in 2003, the smoking prevalence was still high with a rate of 57% among men and 4% among women.² This level of smoking prevalence in Korean men ranks the highest in the world and Korea is therefore one of the nations most highly affected by this global, public health problem.

In 2002, the proportion of deaths due to cardiovascular disease (CVD) in Korea was 21.7% (60.9/100,000) in men and 29.2% (66.9/100,000) in women.³ Although this proportion is not as high as that in developed, western countries, CVD is the number two cause of death among Korean men, and the number one cause of death for Korean women.

However, there are few studies focusing on tobacco control efforts among patients who have smoking related diseases in Korea. Using multiple search methodologies, we found no research focused on the smoking behavior of Korean patients with CVD during hospitalization. According to the Korean national data,⁴ a quarter of all patients who visit outpatient clinics or ERs due to CVD are hospitalized. A large number of CVD patients currently occupy Korean hospitals and need professional education and counseling to help them quit smoking. However, basic information on Korean CVD patients -- such as their smoking behavior, including their smoking history, their smoking behavior during hospitalization or their adaptation to the hospital environment with smoking bans -- is not

available.

The purposes of this study are to: 1) describe aspects of demographics, cardiovascular risk factors, psychosocial risk factors and hospitalization factors in men in Korea who are smokers and who are hospitalized with CVD; 2) describe their smoking behavior before admission to the hospital and during hospitalization; and 3) identify factors associated with levels of addiction and violation of hospital smoking ban.

Designs and Methods

This is a descriptive cross-sectional study. The data collection period spanned January to August of 2004.

Settings and Samples

A convenience sample of subjects was obtained at two university hospitals located in Seoul, Korea's capital city. These hospitals are both university hospitals that have modern facilities and provide high quality services. Hospital policy in both hospitals prohibits smoking inside the building under hospital policy. Patients hospitalized in these hospitals are on relatively middle class of socioeconomic status. Since the National Health Insurance program of Korean government covers whole population as a compulsory social insurance system and the Medical Aid program is also available for low income families,⁵ almost all of hospitalized patients are under health insurance.

Inclusion criteria were: 1) 18 years of age or older; 2) diagnoses of a CVD, including coronary heart disease (angina pectoris, unstable angina, or myocardial infarction), heart failure, valve abnormalities, or peripheral vascular disease; 3) a history of tobacco use within the past month; and 4) hospitalized on a cardiology unit.

Exclusion criteria included the following: 1) being unable to speak, read or write Korean; 2) presence of concurrent psychiatric problems such as dementia or schizophrenia or diminished level of consciousness; and 3) medically unstable. Medically unstable patients were excluded because of the potential subject burden of participation with a long interview based on a questionnaire. The subject's physician was asked about the medical stability of each potential subject. For the same reason, patients admitted to the intensive and cardiac care units were excluded from the study. However, once they transferred to the cardiology unit, they were included in the study.

Data were collected after approval was obtained from the Committee on Human Research of the University of California San Francisco in the United States and from the chairs and medical staffs at cardiology departments of the two Korean hospitals.

Measurements

A semi-structured questionnaire was used to elicit information about the subject's demographics, CVD risk factors, psychosocial risk factors and smoking behavior. Hospitalization periods, admission diagnoses, surgical diagnoses and intervention procedures were obtained through reviews of medical records.

The questionnaire, modified from that described in a previous study,⁶⁻¹¹ included questions covering the topics of demographics, CV risk factors, psychosocial risk factors, hospitalization factors, smoking behavior before the index hospitalization, smoking behavior during the index hospitalization, needs for future smoking cessation and the smoker's beliefs about the health benefits of quitting smoking. Subjects' responses to questions about the need for future smoking cessation and about their beliefs about the health benefits of quitting smoking are discussed at elsewhere¹² and instruments and

results related to these issues will not be presented in this paper. Only the Center for Epidemiologic Studies Depression Scale (CES-D) is available in Korean and the other instruments needed translation to Korean. For that, the English versions of instruments were evaluated for suitability for the Korean population, then modified and translated, with special consideration of linguistic and cultural differences. Two independent bilingual persons handled translation, providing independent, back translations; one was a researcher and the other was a Korean American with an English literature and Linguistics background. The Korean version of the instrument was pre-tested in a small group to evaluate the feasibility of the questionnaire in terms of comprehension, length of time for administration and acceptance of the interview. Interviews were well conducted and no major change was made.

Demographics

We measured age, gender, level of education, marital status, employment status, and monthly family income.

Hospitalization Risk Factors

Consideration of hospitalization factors included assessment on information about the hospital site, length of stay, admission diagnosis, and surgical intervention or diagnostic procedures during the index hospitalization. This information was obtained from medical records.

Cardiovascular Risk Factors

Cardiovascular risk factors included lipid abnormalities, hypertension, diabetes, body mass index (BMI), and physical activity. This data were obtained primarily from medical records and further completed by information from self-reports. To assess physical

activity subjects were asked, “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, bicycling, calisthenics, golf, gardening, or walking for exercise?” This question has been used by the Behavioral Risk Factor Surveillance System (BRFSS).¹³ When subjects answered yes, a follow up question was provided to ask if the subjects meet the recommended amount of physical activity by the Centers for Disease Control and Prevention.¹⁴ The question was “During the past month, did you participate in moderately intensive physical activity for at least 30 minutes?”

Psychosocial Risk Factors

Psychosocial risk factors were those factors that might be psychosocially affecting CVD and smoking use. These included history of psychiatric problems, alcohol consumption, depression, perceived stress and social support.

Alcohol Use

Current drinking status, amount of alcohol consumption per month, and alcohol dependence was measured to evaluate alcohol use. Among men who drink, the amount of alcohol consumption per month was calculated based on the amount of alcoholic beverage per occasion and the number of occasion during the last month. Total amount of alcohol per month was the total amount of alcohol (g) of each bottle or can multiplied by the number of bottle or can per occasion multiplied by the number of occasion per month. To measure alcohol dependence, the four-question CAGE instrument¹⁵ was used. CAGE is easy to administer and has been known to have good sensitivity and specificity for alcohol abuse or dependence (74-89% and 79-95%, respectively) for both inpatients and outpatients.¹⁶

Depression

The Korean version of CES-D¹⁷ was used for screening for depression. The total scores range from 0 to 60 and a cutoff point of 16 or above indicates depression.^{18, 19} For validity of the Korean version of the CES-D, a previous study reported Cronbach alpha = 0.89 - 0.93, and test-retest $r = 0.68$ ($p < 0.001$).¹⁷ For this study, Cronbach's alpha was 0.88.

Perceived Stress

Perceived stress is an individual's perception and evaluation of his or her abilities to cope with the demands posed by specific events or experience.²⁰ To measure perceived stress, the Perceived Stress Scale (PSS)²⁰ was used. Possible scores range from 0 to 56, and a higher score indicates more stress.²¹ In a study of college students conducted by Cohen, the coefficient alpha reliability estimate for the four-item PSS was 0.72.²¹ The test-retest reliability over a two-month interval was 0.55.²¹ In Sivaranjan Froelicher's study of 277 women smokers, the Cronbach's alpha was 0.84.²² For this study, Cronbach's alpha was 0.66.

Social Support

To measure social support, the Enhancing Recovery in Coronary Heart Disease (ENRICH) Social Support Inventory (ESSI) was used.²³ The possible total score can range from 8 to 34. A lower total score means less social support. The Cronbach's alpha was 0.86 in the study, with 155 patients with acute MI.^{24, 25} For this study, the Cronbach's alpha was 0.78.

Smoking Behavior before Index Hospitalization

The topic of smoking behavior before index hospitalization refers to subjects'

smoking use, smoking cessation and relapses that have occurred before index hospitalization. The data included smoking histories, smoking patterns, quitting attempts and relapse experiences. The information for this topic was obtained from self-reports.

Smoking History

Smoking history refers to the individual's smoking history, including the age at which the subject started smoking, years since they first began to smoke regularly, and number of packs they smoke when smoking regularly. The pack-years of smoking was calculated with that of the number of packs smoked per day, multiplied by the number of years of smoking regularly.

Smoking Patterns

Smoking patterns include current smoking status, smoking amounts, type of tobacco product and cigarette brand. If their cigarette brand was a light cigarette, the reasons for using a light cigarette were also asked.

Smoking Environment

Smoking environment refers to subjects' social environment related to smoking. This included number of people smoked in their households beside themselves, and whether they had smoking bans in their homes or workplaces.

Level of Addiction

To measure the level of nicotine addiction, we used the 6-item Fagerstroem Questionnaire for Nicotine Dependence (FTND).²⁶ Scores in this questionnaire can range from 0 to 10, and a total score of greater than 7 indicates nicotine dependence. The Cronbach's alpha is known to be 0.61²⁶-0.7.^{26, 27} In a Korean study, the Cronbah's alpha was 0.72,²⁸ and for this study, the Cronbach's alpha was 0.59. It is known that the first

question, time of first cigarette, as well as the total score, provide reliable indicators of the level of nicotine addiction.²⁹

Attempts to Quit Smoking and Relapse Experiences

Subjects who had made previous attempts to quit were asked to provide the following information about their last quitting attempt: the number of serious quitting attempts made in the past (serious quitting is defined as: staying free from smoking for at least for one day), length of abstinence period of the last quitting attempt, reasons for the last quitting attempt, reasons for relapse, presence of withdrawal symptoms and quitting method.

Regardless of whether or not they had a history of attempting to quit, all subjects were asked whether they had ever received any advice for quitting smoking from health care providers in the past, and, if so, who provided the advice.

Smoking Behavior during Index Hospitalization

Smoking behavior during index hospitalization refers to smoking behavior exhibited during the index hospitalization phase. Information considered to analyze this behavior included violation of hospital smoking ban, smoking amounts, smoking place, knowledge about hospital smoking ban policies, advice from health care providers about quitting smoking and intention to quit smoking. The intention to quit smoking was measured by means of the same question used by Taylor,³⁰ “Do you intend to stay off cigarettes or other tobacco products next month?” Subjects responded to a 7-point scale (1=definitely no; 7=definitely yes). The confidence in quitting smoking was also measured by a single-item self efficacy scale adopted from the previous studies, “how confident are you that you will be able to stay off cigarettes once you are discharged from the hospital?”^{6, 31}

This was measured on a scale with score rating ranging from 0 (not at all confident) to 10 (totally confident).

Procedure

Before approaching potential subjects, medical and nursing personnel in the units were informed of the study and its purpose at staff meetings. Staff nurses then assisted in recruitment for the study by informing potential subjects about the study. The researcher then contacted all interested subjects. The potential subject was given an overview of the purpose of the study. To verify the subject's smoking status, the researcher asked directly whether or not the subject had smoked during the last month. The researcher also explained the study to the subject, and answered any questions. When the subject was ready to be enrolled, written informed consent was obtained. The data collector for this project is a native Korean nursing researcher, and all interviews were conducted in Korean.

Data Management and Analysis

The SPSS, version 11.0 was used for analysis. Descriptive statistics and distribution of variables were evaluated for any data entry errors and for any discrepancies verified by the original, raw data.

To describe the study population and their smoking behavior, actual numbers for frequency, mean with standard deviation, median with range and proportion were used.

To determine potential predictors of levels of addiction and violation of hospital smoking ban, variables that were statistically significant in previous literature and in univariate analysis were defined. Once defined, the variables were evaluated using multiple logistic regression for their independent effects. The results are presented with

odds ratio (OR) with a 95% confidence interval (CI).

Results

A research nurse approached 503 men and 431 women patients hospitalized with a CVD diagnoses. Among them, 195 men and 19 women were current smokers. A total of 98 subjects, including 97 men and 1 woman, provided the data for this study. Since it is not possible to have any statistically meaningful conclusion from one woman's data, the reported results provide data representing these 97 men.

Sample Characteristics

Demographics (Table 3.1)

The 97 men were relatively young (mean age: 54.1, SD: \pm 9.6). More than 74 % of the men graduated from high school or more. Most (85.6%) were married and fully employed (77.3%). The median category of family income for these men was 2,500 – 2,999 thousand won (\$ 2,080 - \$2,499) per month.

Hospitalization Factors (Table 3.2)

The mean hospital stay for the men at the time of the interview was 5.4 days (SD: \pm 5.2). The three most frequently reported admission diagnoses were myocardial infarction (23.7%), angina or chest pain (21.6%) and unstable angina (20.6%). A large proportion of the men received various types of cardiovascular related, invasive diagnostic tests and interventions. The test most frequently reported (60.8%) was cardiac catheterization.

Cardiovascular Risk Factors (Table 3.3)

The most common CVD risk factors the men reported were; physical inactivity (58.8%, no exercise at all), hypertension (46.4%), overweight or obesity (44.3%, BMI \geq

25), diabetes (28.9%), and hyperlipidemia (23.7%).

Psychosocial Risk Factors (Table 3.4)

Only one percent of the men had a history of psychiatric problems. Sixty percent of the men reported drinking alcoholic beverages. Among them, 53.4% of men answered yes to more than two CAGE questions, an indicator of alcoholism. Among the men who reported drinking, the majority drank soju^a (86.2%), a traditional Korean alcoholic beverage, and 10.3 % of the men drank beer. Among soju drinkers, the average amount of soju the men drank per month was 18.7 bottles (SD: ± 15.9) and for beer drinkers, the average amount of beer drunk per month was 38.6 bottles (SD: ± 38.6). The mean amount of alcohol consumption per month among men who drank any alcoholic beverage was 1,660.3g. In the univariate analysis, CAGE and the total amount of alcohol consumption per month was highly correlated (Spearman's $\rho=0.81$, $p<0.005$).

The mean score of CES-D was 7.9 (± 9.8), and 17.5% of the men were found to have a total score ≥ 16 , indicating depression. The mean score of PPS was 19.7 (SD: ± 7.0), and the mean score of social support was 27.6 (SD: ± 6.3).

Smoking Behavior before Index Hospitalization (Table 3.5-3.7)

On average, the men began smoking at about the age of 20 (Mean 19.9, SD: ± 4.5) and have smoked about one pack per day (median 1.0, range: 0.1 – 5.0) regularly for more than 30 years (mean 33.0, SD: ± 11.0) (Table 3.5). All were daily smokers and currently most of them (65%) smoked more than one pack per day. All men smoked manufactured cigarettes and the majority smoked Korean cigarettes (67%). Over forty percent (41.2%) of the men said they smoked light cigarettes and said the reason for

^a Soju is traditional Korean alcohol made by rice. The sizes of manufactured soju are ranged from 300cc~700cc and the alcohol concentration is ranged 24~25%.

choosing this was “for health” (62.5%). Only one man smoked menthol cigarettes. About one-third of men (28.9%) had a score of 7 or more on the FTND scale, indicating a high level of nicotine dependence. The majority (64.9%) smoked their first cigarette in the morning within 30 minutes of waking, an indicative of nicotine dependence.

Twenty-seven percent of the men were living with at least one smoker, and 36% were living with at least one minor (<18 years) (Table 3.6). About one-third of the men (32%) did not have any smoking ban at home, and 61.9% did not have any type of smoking ban at their working place.

Most of the men (72.2%) had made at least one serious quitting attempt in the past (Table 3.7) and the median number of days of refraining from smoking during the last quitting attempt was 15.0 days (range: 1– 1,095 days). The three most frequently reported reasons for the last quitting attempt were ‘my health’ (81.4%), ‘previous hospitalization experience’ (10.0%), and ‘bad smell and dirty environment’ (10.0%). The three most frequently reported reasons for the relapse following their last quitting attempt were ‘withdrawal symptoms’ (55.7%), ‘chronic stress’ (35.7%) and ‘social event’ (25.7%). Chronic stress and life crisis was not statistically significant in association with perceived stress (PSS). The two most frequently reported withdrawal symptoms were ‘craving’ (66.7%) and ‘nervousness’ (38.5%).

Forty percent of men (40.1%) reported that they tried quitting on their own without any aid. About 11 percent of the men reported that they used eating snacks as a quitting method, and 10.3 percent reported that they used nicotine replacement therapy (NRT), including gum and patches. There was no statistically significant association between level of addiction (time to the first cigarette in the morning) and trying NRT in the past.

Over 50 percent of the men reported that they were advised to quit smoking by health care providers before the index hospitalization. The men reported that the three most frequent types of health care professionals who had advised them to quit smoking were physicians (92.7%), nurses (49.1%) and pharmacists (38.2%).

Smoking Behavior during Index Hospitalization (Table 3.8)

Almost all men (91.7%) knew about the smoking ban policy. Despite their awareness of the hospital smoking ban, one in five men (21.6%) smoked during the index hospitalization. The most common smoking place was the 'building entrance' (47.6%) and the 'outside of the building' (33.3 %). The men learned about the hospital's smoking ban most frequently from posters or signs (66.0%). Only 11.3% of the men reported that they heard about the hospital smoking ban policies from their health care providers. The proportion of the men who were advised to quit smoking from physicians or nurses was 63%. Almost all of the men (92.8%) reported having strong intentions to quit smoking within a month after hospital discharge.

Predictors of Levels of Addiction (Time to the First Cigarette in the Morning)

FTND's six-item questionnaire was administered to the men. However, all men answered "no" to the fifth question. Therefore, the score of this questionnaire was not appropriate to the study. In addition, the first question, time to the first cigarette in the morning, was highly correlated with the total FTND score, and this single item served as a better indicator than did the total FTND score in all possible multiple logistic regression models as well as for univariate analysis. Therefore, for the multiple logistic regression analysis, time to the first cigarette was used as the outcome variable.

Through literature review and univariate analysis, five variables were identified as

significantly associated with time to the first cigarette (Table 3.9). Those five variables are: age, level of education, depression, age of starting smoking, and number of cigarettes smoked per day. When multiple logistic regression was used with five variables, lower education (OR: 3.26, 95% CI: 1.03, 10.39), starting smoking at early age (OR: 3.30, 95% CI: 1.14, 9.50) and smoking more cigarettes per day (OR: 7.27, 95% CI: 1.48, 35.83) are statistically significant independent predictors of outcome variable (time to first cigarette) in a model evaluated with 5 variables.

The mean machine- determined yield of nicotine or tar per cigarette, and whether or not men smoked light cigarettes, were not statistically significant variables when they were entered separately into multiple logistic regression with age, education, depression, age of starting smoking, and number of cigarettes smoked per day.

Predictors of Violation of Hospital Smoking Bans during Index Hospitalization

Through literature review and univariate analysis, four variables were identified as potentially related to violation of hospital smoking ban (Table 3.10). These four variables are: age, level of education, “time to first cigarette” in the morning, and intention to quit smoking. When multiple logistic regression analysis was used with these four variables, only one variable, intention to quit smoking, provided statistically significant independent contributions to the prediction of outcome (violation of hospital smoking ban). Men who had high intention to quit smoking within 1 month after hospital discharge, were less likely to violate hospital smoking ban (OR: .09, 95% CI: .03, .31).

Since confidence in quitting smoking was highly correlated with intention to quit smoking, the association between confidence in quitting smoking and violation of hospital smoking ban, was evaluated. In the model that includes age, level of education

and “time to first cigarette” in the morning, confidence in quitting smoking (OR: 0.22, 95% CI: 0.07, 0.68) was a statistically significant predictor of violation of hospital smoking ban. However, when the model contained both intention to quit smoking and confidence in quitting smoking, intention to quit smoking was still statistically significant, but confidence in quitting smoking was not statistically significant.

In Table 3.10, only OR (2.15, 95% CI: 0.62, 7.38) for “time to first cigarette” in the morning was presented. However, other variables that were highly associated with this variable (age of starting smoking, number of pack years and number of cigarettes smoked per day) were tested separately in multiple logistic regression with the variables of age, level of education and intention to quit smoking, but none of these variables were statistically significant.

To explore other potential associations, several variables were also tested using multiple logistic regression analysis. These variables were presence of a smoking ban at home or at work, previous quitting experiences, including the number of serious quitting attempts and the length of the abstinence period during the last quit attempt, experience of withdrawal symptoms during the last quitting attempt, receipt of advice to quit smoking from physicians or nurses during hospitalization, depression, perceived stress, social support, CAGE and total amount of alcohol consumption per month. None of these variables was statistically significant by itself.

Discussion

This is the study of smoking behavior of Korean patients hospitalized with CVD. These men (n=97) are clearly differentiated from subjects in previous literature.³¹⁻³³ The men were all smokers, had been diagnosed with CVD, and were under hospital smoking

ban policies during hospitalization.

While the study was originally focused on both men and women patients, it was not possible to recruit a sample of women. The research nurse approached 431 women, 19 of whom were recognized by the nurse as current smokers (4.4%), yet only one woman (0.2%) agreed to provide all the data that required for the study. One possible reason for this extremely low rate of female enrollment is the low smoking rate (4%)² among middle aged and elderly women in Korea. A second reason might be the negative social attitude of Koreans about women smoking. Women who believe that smoking by women in Korea is not socially acceptable might avoid admitting to a research nurse that they smoke.

The frequency of CVD risk factors among these men was much higher than for men attending outpatient clinics or for the general Korean population.³⁴⁻³⁹ Specifically, these differences were apparent within these variables: hypertension (46.4% vs 36.4-28.9%), diabetes (28.9% vs 4.0-4.7%) and hyperlipidemia (23.7% vs 8.9-11.4%). The mean of BMI is just slightly higher (24.7 vs 23.1 -23.8) and the proportion of physical inactivity (no exercise at all: 59.8% vs 70.1%) is slightly lower. BMI has widely used cutoff points to define overweight (25kg/m²) or obesity (30kg/m²). However, currently it has been noticed by WHO⁴⁰ and brought out in other literature^{40, 41} that definitions may need to establish different cutoff points of BMI for Asians, since this BMI tends to be slightly lower among Asians. In addition to classic criteria, the WHO experts recommended other possible cut off points, 23 kg/m² or higher, representing increased risk; and 27.5 kg/m² or higher, representing high risk. Although the WHO experts did not provide clear cut off points to determine over weight or obesity (like classic cut off points) only for Asian

population due to lack of evidence, these new criteria provide the criteria for more careful evaluation for Asian population who are at risk. In this study, a total of 44.3 percent of subjects were either overweight or obese, based on the classic criteria; however, when the new recommended criteria (23 kg/m^2) was applied, results showed that 76.3 percent of subjects were at risk.

Regarding psychosocial risk factors, a low frequency of depressive symptoms (17.5%), low mean score of PPS and ESSI, and a high frequency of alcoholic problems (53.5%) were noticed among the men. It is known that patients with CVD tend to have a higher prevalence of depression than the general population in the U.S.⁴²⁻⁴⁹ and previous Korean literatures reported 23 to 35 % of men having depressive symptoms in Korean general population.^{50 51} For the purpose of comparison with other studies, the researcher tried to find a study focusing on Korean patients with CVD, but none could be located.

Thirty-two percent of men endorsed 2 or more items on the CAGE questionnaire which is as high as the proportion in male smokers in the U.S. (28.6-38.9%).⁵² The positive association between alcohol consumption and smoking, quit attempts, and relapses is well known.⁵³ Most clinical intervention studies have excluded patients with alcohol abuse because of the need to provide dual addiction intervention.^{7, 30, 54} Given the high proportion of high scores for the CAGE questionnaire, dual addiction intervention should be considered when a smoking cessation intervention is designed, since alcohol use has been shown to lower the abstinence rate for smokers.^{31, 55} Korean clinicians need to assess the alcohol problem of this population and the Korean version of the CAGE questionnaire seems to be an appropriate screening tool. In this study, the Korean version of the CAGE questionnaire was highly associated with total amounts of alcohol

consumption. In addition, the questionnaire was simple, culturally appropriate and feasible to hospitalized patients. Further validation of the association between the CAGE questionnaire and clinical features was not conducted in this study. Yet it seems apparent that use of the CAGE questionnaire by clinicians who seek to understand the drinking problems of their CVD patients who are smokers could provide data needed for smoking cessation intervention.

Several interesting characteristics were found related to the study subjects' smoking behavior. First, they began smoking quite late, about age 20. This age is similar to the mean age of 20.4 that is presented in previous literature for Korean general population on the topic,² but this average age for Korean to start smoking is quite late when compared to findings in literature for the U.S. general population (age 15.4-17.6).⁵³ A second general finding in our study was that all subjects smoked cigarettes with very low yield of nicotine and tar. In the United States, according to established standards, cigarette brands that yield approximately 1 to 5 or 6 mg of tar are generally called "Ultra Light"; and brands yielding between approximately 6 to 15 mg tar are called 'Light'; and brands yielding more than 15 mg of tar are called 'Regular' or 'Full Flavor'.⁵⁶ In this study, 41 percent of the men reported that they smoked light cigarettes, considering these to be their favorite brands. However, when calculated the mean yield of nicotine and tar for all smokers, the average yield of nicotine per cigarette was 0.6 mg (SD: \pm 0.2), and the mean yield of tar was 5.8 mg (SD: \pm 2.6). Furthermore, the mean difference of nicotine (mean difference: 0.009mg, $t= 0.232$, $p= 0.817$) and tar per cigarette (mean difference: 0.195mg, $t= 0.332$, $p= 0.741$) was not statistically significant between men who reported that they smoked regular cigarettes and those who reported that they smoked light cigarettes.

Using multiple logistic regression to predict levels of addiction (“time to first cigarette”), we find that regardless of whether or not the men smoked “light” cigarettes, this variable of “mean amounts of tar or nicotine per cigarette” was not statistically associated with the variable of “time to first cigarette”. Third, and quite interestingly, a relatively high proportion of the men (12.4%) reported that they used a specific, cigarette supplement product as their previous quitting method. In Korea, nicotine gum and patches can be purchased at a pharmacy without a physician’s prescription (only nicotine spray requires a physician’s prescription).⁵⁷ A certain Korean cigarette supplement, “Nosmo Q”, can be purchased without a prescription and was used by some of the men in this study. The product includes Ucommia Ulmoides Leaf, and does not have any tobacco. The shape of the product is exactly like conventional filtered cigarettes and it was originally developed as a quitting aide. Details about this product are presented in elsewhere.¹² Lastly, “time to first cigarette” was a feasible measurement to assess levels of nicotine addiction for this population. According to previous studies that have measured levels of nicotine addiction by using biochemical verification, the variable “time to first cigarette” is highly correlated with saliva cotinine levels identified in previous studies of Switzerland and the United States^{26, 27} and in studies of urinary cotinine levels among Korean adults.²⁸ In addition, the single variable has strong advantage compared to the multi-item questionnaire when it is used in clinical settings for patients who are critically ill and who feel burdened by too many items on long questionnaires that may be administered by staff members.

The presence of a smoking ban in a hospital falsely leads health care providers to believe that hospitalized patients do not smoke, but a high proportion of patients (22%)

smoked during hospitalization. The proportion seems low compared to the 25%³² to 35%⁵⁸ pattern of violation of hospital smoking ban policies found in previous studies. However, this lower proportion might be in part due to the fact that the median hospital stay from the admission to the interview was only four days for subjects in this study, which is quite short compared to the longer average length of hospital stay, which was 13.2 days, for CVD male patients in a 1999 study.⁵⁹ In addition, it has been known that the rate of violating hospital smoking ban is relatively low among CVD patients in previous studies.³³

Given the fact that all study subjects were smokers and this significant proportion of smoking during hospitalization, it is amazing that only 63 percent of the men were advised to quit smoking during hospitalization and that only 11.3 percent of the men received information about their hospital's smoking ban policies from health care providers. A 1999 Korean study found that only 36.5 percent of hospitalized patients reported that they had received any information about the benefits of quitting smoking from their health care providers.⁵⁸ However, it is difficult to compare this proportion with our study because of time gap. The 2000 report for the Agency for Healthcare Policy and Research Guidelines noted that even minimal interventions lasting less than three minutes can increase tobacco abstinence rates, and that even brief counseling interventions result in 13.4 percent smoking cessation.^{60, 57} It is important to recognize that for patients who are admitted to hospitals, and who have already spent several days without smoking, relapse prevention intervention is important for avoiding a patient's return to smoking upon returning home. Thus health care providers should actively participate in providing smoking cessation intervention for this population during this valuable period. For that,

health care providers should be well ready through education and training to provide proper intervention for patients.

This study has several limitations. This is a cross-sectional study, therefore causal associations cannot be drawn. The data did not include any women due to their low availability. In addition, men were enrolled using a convenience sampling method. Therefore, generalizability is limited. However, the men showed a wide range in their intention to quit smoking, since this study was not part of a smoking cessation intervention program. Therefore, these men might represent general patients hospitalized with CVD.

The data were collected from men's self reports and medical record abstractions and any biochemical verification was not used. Thus recall bias and misclassification could be concerned.

Smoking is not considered to be socially unacceptable by Korean men. However, the men were all hospitalized patients under medical supervision, and most of them were sharing their rooms with other patients and had visitors, including families and friends. These social aspects might have made them behave in more socially desirable ways, thus affecting their self reports about smoking during hospitalization.

Nicotine withdrawal symptoms during hospitalization were not evaluated. Since withdrawal symptoms vary and could be confused with other symptoms related to hospitalization, such as medical surgical intervention, it could be difficult to evaluate this aspect in a cross-sectional study that does not have baseline data. We did not evaluate whether or not patients used NRT during their hospitalization. Additionally, past hospitalization histories were not obtained.

Despite these limitations, this study presents several important findings. This is the first study to address smoking behavior in men hospitalized with cardiovascular disease in Korea. About one-fifth of subjects smoked during hospitalization, suggesting that these men need strong smoking cessation advice during hospitalization. In addition, a high proportion of these men was at risk of excessive alcohol use; therefore, intervention for dual addiction -- nicotine and alcohol -- should be considered. Health care providers should actively participate in providing smoking cessation intervention for this population. For that, proper education and training for health care providers is needed in Korea.

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Table 3.1 Demographics (n=97)

	%	n
Age	Mean 54.1 (\pm 9.6) Range: 29-76	
Education		
Postgraduate (more than 16 years)	5.2	5
College graduate (14-16 years)	26.8	26
High school graduate (12 years)	42.3	41
Middle school graduate (9 years)	11.3	11
Elementary school graduate (6 years)	9.3	9
No formal education or some elementary school	4.1	4
Missing	1.0	1
Marital status		
Married	85.6	83
Single	5.2	5
Widowed	6.2	6
Divorced	2.1	2
Separated	1.0	1
Employment status		
Full time employed	77.3	75
Part time employed	2.1	2
Unemployed, less than 1 year	3.1	3
Unemployed, equal or more than 1 year	1.0	1
Retired	10.3	10
Disabled	6.2	6
Monthly family income¹	Median category: ₩ 2,500,000 – 2,999,000 (\$ 2,080 - \$2,499)	
Less than ₩1,000,000 (\$ 830)	17.5	17
₩ 1,000,000 - ₩ 1,499,000 (\$ 830-1,249)	4.1	4
₩ 1,500,000 - ₩ 1,999,000 (\$ 1,250-1,599);	8.2	8
₩ 2,000,000 - ₩ 2,499,000 (\$ 1,600-2,079)	13.4	13
₩ 2,500,000 - ₩ 2,999,000 (\$ 2,080-2,499)	12.4	12
₩ 3,000,000 or more (more than \$ 2,500)	35.1	34
Don't know.	7.2	7
Refused	2.1	2

In Korean Won at 2004 (in U.S. Dollars at 2004). \$ 1 is equivalent to ₩ 1,200¹

Table 3.2 Hospitalization factors (n=97)

	%	n
Hospital stay from the admission to the interview (days)	Mean 5.4 (\pm 5.2) Median 3.9 (Range: 0 - 30) ¹	
Admission diagnosis ²		
Myocardial infarction	23.7	23
Angina or chest pain	21.6	21
Unstable angina	20.6	20
Arrhythmia	15.5	15
Coronary artery occlusive disease (CAOD)	9.3	9
Congestive heart failure	8.2	8
Valve disease	4.1	4
Other ³	7.2	7
Cardiovascular related, invasive diagnostic test or intervention from the admission to the interview ³		
Cardiac catheterization	60.8	59
Percutaneous transluminal coronary angioplasty (PTCA)	30.9	30
Stent	28.9	28
Coronary artery bypass graft (CABG)	4.1	4
Intracardiac electrophysiology study (EPS), radio frequency (RF) ablation	5.2	5
Peripheral angiography	2.1	2
Transesophageal echocardiogram (TEE)	2.1	2
Other ⁴	8.2	8

The data were not normally distributed. Therefore both mean with standard deviation and median with range are presented.¹; Not mutually exclusive²; Hypertension, aortic aneurysm, abdominal aortic occlusion, post operational (aortic valve replacement) wound dehision, ischemic cardiomyopathy³; Coarctectomy, venogram, embolization, valve replacement or repair, transthoracic echocardiogram (TTE), artery graft interposition, and removal of pacemaker⁵

Table 3.3 Cardiovascular risk factors (n=97)

	%	n
Hypertension	46.4	45
Hyperlipidemia	23.7	23
Diabetes Mellitus	28.9	28
Body Mass Index	Mean: 24.7 (\pm 2.9) Range: 18.6 – 30.8	
\leq 19.9	5.2	5
20-22.9	18.6	18
23-24.9	32.0	31
25-27.4	27.8	27
27.5 -29.9	11.3	11
30-32.4	5.2	5
Any exercise during the past month? Yes	41.2	40
Number of days of doing regular moderate exercise for at least 30 minutes per week (n=40)	Mean: 4.4 (\pm 2.5) Median: 7 (range: 1-7) ¹	
7 days	45.0	18
5 -6 days	2.5	1
4-3 days	22.5	9
2-1 days	25.0	10
0 days	5.0	2

The data were not normally distributed. Therefore both mean with standard deviation and median with range are presented.¹

Table 3.4 Psychosocial risk factors (n = 97)

	%	n
History of psychiatric problem	1.0	1 ¹
Do you drink alcohol? Yes	59.8	58
What kind of alcohol do you drink? ² (n=58)		
Soju ³	86.2	50
Beer	10.3	6
Mak-gul-li ⁴	5.2	3
Other ⁵	6.9	4
Total amount of alcohol consumption per month (g/month) (n= 58)	Mean 1660.3 (\pm 1423.0) Median 1170.0 (range: 60 – 6480) ⁶	
CAGE score (n= 58)	Mean: 1.7 (\pm 1.3)	
0	24.1	14
1	22.4	13
2	19.0	11
3	29.3	17
4	5.2	3
Depression (CES – D)	Mean 7.9 (\pm 9.8), Median 4 (range: 0 – 51) ⁶	
≥ 16	17.5	17
Perceived stress (Cohen's Perceived Stress Scale)	Mean 19.7 (\pm 7.0), Range: 0-47	
Social support (ESSI)	Mean 27.6 (\pm 6.3), Range: 8-34	

Anxiety disorder¹; Not mutually exclusive²; Soju is traditional Korean alcohol made from rice. The sizes of manufactured soju are ranged from 300cc~700cc, but mostly 300-360 cc and the alcohol concentration is ranged 24~25%.³; Mak-gul-li is traditional Korean alcohol made from rice. The size of manufactured mak-gul-li is mostly 750cc and the alcohol concentration is 7%.⁴; Other, Chung-ha (Korean traditional alcohol made by rice. The size of it is 375cc, alcohol concentration is 14%) (2), wine (1), whisky (1)⁵; The data were not normally distributed. Therefore both mean with standard deviation and median with range are presented.⁶

Table 3.5 Smoking behavior before the index hospitalization (n= 97)

	%	n
How old were you when you began to smoke?	Mean 19.9 (\pm 4.5), Range: 10 – 35	
How many years have you smoked on a regular basis?	Mean 33.0 (\pm 11.0), Range: 5 – 58	
How many packs did you smoke since you smoked on a regular basis?	Mean 1.3 (\pm 0.7), Range: 0.1 – 5.0	
Pack years	Mean: 42.4 (\pm 29.3), Range: 5.0 – 180.0	
How many cigarettes do you smoke per day?	Mean 22.3 (\pm 16.6), Range: 2 – 100	
< 10	15.4	15
10 \leq , < 20	19.6	19
20 \leq , < 40	46.4	45
40 \leq	18.6	18
Favorite brand		
KT & G (Korea)	67.0	65
British American Tobacco	12.4	12
JTI (Japan)	7.2	7
Philip Morris	6.2	6
Missing	7.2	7
The mean machine-determined yield of nicotine per cigarette among brands (mg)	Mean 0.6 (\pm 0.2), Range: 0.1 – 0.9	
The mean machine-determined yield of tar per cigarette among brands (mg)	Mean 5.8 (\pm 2.6), Range: 1.0 – 14.0	
Is your favorite brand a light cigarette? Yes	41.2	40
Why do you smoke light cigarettes? (N= 40) ¹		
For health	62.5	25
Better taste	42.5	17
Other ²	12.5	5
FTND		
Sum Score	Mean: 4.7 (\pm 2.6), Range: 0 – 9	
\geq 7	28.9	28
Time to first cigarette in the morning: \leq 30	64.9	63

Not mutually exclusive¹; Other, Better shape, habit, less painful to my throat, less smell on my body²

Table 3.6 Home and workplace environment regarding smoking

	%	n
Do you live with a smoker at your home besides yourself? Yes	26.8	26
Do you live with a minor at you home? Yes	36.1	35
Smoking ban at home		
No ban	32.0	31
Partial ban inside of house	50.5	49
Total ban inside of house	11.3	11
Total ban both inside and outside of house	6.2	6
Smoking ban at workplace		
Working inside of a building		
No ban inside of a building	44.3	43
Partial ban inside of a building	4.1	4
Total ban inside of a building	8.3	8
Total ban both inside and outside of a building	1.0	1
Working outside of a building		
I can smoke while I am working	17.5	17
I cannot smoke while I am working	2.1	2
I do not have a regular workplace	22.7	22

Table 3.7 Quitting experience before the index hospitalization

	%	n
Serious quit attempt in the past? Yes (n= 97)	72.2	70
The number of serious quit attempt (n= 97)	Mean 2.6 (\pm 3.9) Median 1.0 (Range: 0 - 30)	
The number of days of refraining during the last quit attempt (n=70)	Mean 115.8 (\pm 220.5) Median 15.0 (Range: 1– 1095)	
The reason of the last quit attempt (n= 70) ¹		
My health	81.4	57
Previous hospitalization experience	10.0	7
Bad smell and dirty environment	10.0	7
Family health	8.6	6
Colleague health	2.9	2
People's negative attitude against my smoking	7.1	5
Increased price	1.4	1
Decreased taste	1.4	1
Other ²	7.1	5
The reason of the relapse of the last quit attempt (n= 70) ¹		
Withdrawal symptoms	55.7	39
Chronic stress	35.7	25
Social event	25.7	18
Life crisis	15.7	11
Boring	11.4	8
Weight gain	2.9	2
Other ³	8.6	6
Which withdrawal symptoms did you experience? (n= 39) ¹		
Craving	66.7	26
Nervous	38.5	15
Irritability	30.8	12
Anxiety	30.8	12
Depression	25.6	10
Difficulty to focus	23.1	9
Dizziness	10.3	4
Other ⁴	15.4	6
Quitting method you have ever used in the past (n= 97) ¹		
My own way	40.2	39
Nicotine Replacement Therapy (gum and patch)	10.3	10
Cigarette supplement (Nosmo Q)	12.4	12
Snacks including candy, gum, traditional snack	11.3	11

Acupuncture	5.2	5
Smoking cessation program or education	4.1	4
Other ⁵	4.1	4
Have you ever been advised to quit smoking by healthcare providers before the index hospitalization? Yes	56.7	55
By whom? (n=55) ¹		
Physician	92.7	51
Nurse	49.1	27
Pharmacist	38.2	21
Oriental medicine doctor	5.5	3
Dentist	3.6	2

Not mutually exclusive¹; Other: My colleague's recommendation, my family's recommendation, one of new year plans, quitting campaign in my company, and TV advertisement about hazard of smoking²; Other: Habit, recovering from cold, helps me when I need to work hard, and no reason³; Other: Confusion, forgetfulness, tremor, chest discomfort, anger, insomnia, sleepiness, lack of energy, emptiness and increased having a snack⁴; Other: Empty pipe, reading, medication and watching movie⁵

Table 3.8 Smoking experience during hospital stay from the admission to the interview

	%	n
Smoking during hospitalization (n= 97)	21.6	21
The number of cigarette smoked during hospitalization (n= 21)	Mean 11.7 (\pm 10.2) Range: 1– 40	
The place for smoking (n= 21)		
Building entrance	47.6	10
Outside of the building	33.3	7
Stairs	9.5	2
Bathroom	4.8	1
Rooftop of the building	4.8	1
Knowledge about hospital smoking ban (n= 97)		
Total ban inside of the building	91.7	89
Partial ban inside of the building	2.1	2
Total ban both inside and outside of the building	1.0	1
I do not know	5.2	5
How did you know about hospital smoking ban? (n= 97) ¹		
Poster or signs	66.0	64
Common sense	40.2	39
Informed from health care providers	11.3	11
From physician (n=11)	18.2	2
From nurse (n=11)	90.9	10
Previous hospitalization experience	2.1	2
Others ²	6.2	6
Have you been advised to quit smoking during hospitalization from health care providers? Yes (n= 97)		
From physician (n= 61)	90.2	55
From nurse (n= 61)	67.2	41
Intention to quit smoking in the next month		
Definitely yes	Mean 6.4 (\pm 1.4), Range: 1– 7	
Maybe yes, possibly yes, or probably yes	83.5	81
Definitely no, probably no, or possibly no	9.2	9
	7.3	7
Confidence in quitting smoking (n= 90)		
	Mean 8.1 (\pm 2.6) Median 10.0 (Range: 1– 10)	
< 7	25.6	23
7 \leq , < 10	20.0	18
= 10	54.4	49

Not mutually exclusive¹; Others: TV advertisement about smoking ban in public place (2), other patients (2), no ash tray inside of the building (1), no one who smokes inside of the building (1)²

Table 3.9 Odds Ratio (OR) with 95% Confidence Interval (CI) using multiple logistic regression analysis with 6 independent variables to predict the “time to first cigarette” in the morning” (outcome variable).¹

Predictor variables ²	OR	95% CI for OR	P- value
Age (≥ 54 y)	1.38	0.52, 3.66	0.52
Education (< high school)	3.20	1.01, 10.14	0.04
Depression (CES-D: ≥ 16)	4.01	0.77, 20.85	0.10
Age of starting smoking (≤ 20y)	3.30	1.14, 9.50	0.03
Number of cigarettes smoked per day (>20)	9.71	2.31, 40.90	0.01
Constant	0.28		.031

The time to first cigarette was coded as 1: <- 30 minutes, 0: > 30 minutes.¹; Comparisons: Age (<54 y); Education (\geq high school); Depression (CES-D:< 16); Age of starting smoking (>20y); Number of cigarettes smoked per day (≤ 20).²

Table 3.10 Odds Ratio (OR) with 95% Confidence Interval (CI) using multiple logistic regression analysis with 4 independent variables to predict the “violation of hospital smoking ban” (outcome variable) ¹

Predictor variables ²	OR	95% CI for OR	P- value
Age (≥ 54 y)	0.82	0.27, 2.49	0.73
Education (< high school)	0.84	0.24, 2.94	0.78
Time to first cigarettes in the morning (≤ 30 minutes)	2.15	0.62, 7.38	0.23
Intention to quit smoking (=7)	0.09	0.03, 0.31	< 0.005
Constant	0.99		0.99

Violation of hospital smoking ban was coded as 1:yes, 0: no¹; Comparisons: Age (<54 y); Education (\geq high school); Time to first cigarettes in the morning (>30 minutes); Intention to quit smoking (<7).²

Chapter 4

Knowledge, Attitudes and Beliefs about Smoking and Perceived Needs for Future Smoking Cessation Interventions In Men Hospitalized with Cardiovascular Disease in Korea

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Abstract

Introduction: Korean men have the highest documented smoking rate in the world. CVD is the one of the most significant tobacco related diseases and the second greatest cause of death in Korean men. Healthcare professionals caring for Korean patients hospitalized with CVD need to more fully understand the scope of the problem.

Objectives: The purposes of this study are to: 1) explore knowledge, attitudes and health beliefs about the benefits of quitting smoking, 2) describe perceived needs for future smoking cessation interventions, and 3) identify factors that are associated with the confidence in quitting smoking in men hospitalized with CVD in Korea.

Methods: This is a cross sectional study. A structured questionnaire was administered that addressed health beliefs about the benefits of quitting smoking, intention to quit smoking, confidence in quitting smoking, preferred method for future smoking cessation, and intention to participate in smoking cessation program during hospitalization.

Results: The study sample was 97 men with a mean age of 54.1 (± 9.6) years. Most of the men (74.2%) were high school graduates or more; 85.6% were married; 77.3% were employed full time; and the median category of family income for these men was 2,500 – 2,999 thousand won (\$ 2,080 - \$2,499) per month.

Most of the men were very knowledgeable about health hazard from smoking related

diseases (respiratory disease, CVD, and lung cancer). Most of the men (92.8%) reported their intention to quit smoking in the month after hospital discharge and two-third of the men (74.4%) had moderate to high confidence in their ability to quit smoking. The most common method they reported that they would use for future smoking cessation was quitting by themselves (87.8%). Married (OR: 5.54, 95% CI: 1.33, 23.08), higher score of CAGE (OR: 3.25, 95% CI: 1.20, 8.80), and starting smoking at early age (OR: 2.96, 95% CI: 1.14, 7.68) are statistically significant independent predictors of confidence in quitting smoking in a model evaluated with 5 variables.

Conclusions: Korean men who are smokers hospitalized with CVD were very much aware of the health benefits of quitting smoking and they reported being highly motivated to quit smoking. They were prepared to quit by themselves without any help, but they would be willing to participate in a smoking cessation program if the program is available during their hospitalization. Further research is needed to explore strategies to aid smoking cessation to decrease this CV risk factor.

Key words: Survey, hospitalization, smoking cessation, CVD, Korean men, intention to quit smoking, confidence in quitting smoking, health beliefs.

Introduction

The smoking rate in Korea is high with 57 % of men and 4 % of women reporting to be smokers,¹ and the smoking rate in Korean men is ranked among the highest in the world. Cardiovascular disease (CVD) is the second greatest cause of death in Korean men in 2002.² Cardiovascular disease is a well known tobacco related disease, and it is clear that smoking has adverse effects on prognosis of CVD, outcomes of surgical and medical interventions as well as the development of CVD.³

Despite this very high risk, combined with high smoking rate and evidence of high prevalence of CVD in Korean men, there is little effort focusing on smoking cessation in this population. According to Korean national data,⁴ a quarter of all patients who visit outpatient clinic or emergency room for CVD problems are subsequently hospitalized. Health care professionals have an ideal opportunity to offer these patients smoking cessation intervention while hospitalized.

In United States, pioneering studies⁵⁻⁸ focused on smoking cessation for patients hospitalized with CVD; Bandura's Social Learning Theory⁹ was used to provide a theoretical framework to guide successful smoking cessation programs. These smoking cessation programs identified several important components of successful smoking cessation programs; 1) patients' knowledge, attitudes, and beliefs about the benefits of

quitting smoking; 2) practical suggestions from health care providers; and 3) successful performance of skills (quitting methods) individually designed for patients. In Korea, there are several beginning efforts to implement smoking cessation programs to general patients,¹⁰⁻¹³ but no study to date has addressed hospitalized patients or patients with CVD. In addition, there are no programs in place to identify each smoker who is admitted to the hospital and who could benefit from specific individualized smoking cessation counseling.

Therefore, there is no doubt that these patients need special interventions including education, counseling, and behavioral interventions to help them quit smoking. To develop effective smoking cessation programs for these men, information is needed about their health beliefs about the benefits of quitting smoking, intention to quit smoking, preferred method for smoking cessation, and confidence in quitting smoking.

The purposes of this study are threefold: 1) to explore knowledge, attitudes and health beliefs about the benefits of quitting smoking; 2) to describe perceived needs for future smoking cessation interventions; and 3) to identify factors that are associated with the confidence in quitting smoking.

Designs and Methods

This is a cross-sectional study, part of a larger study that was designed to describe smoking behavior in men hospitalized with CVD in Korea, and has been reported elsewhere.¹⁴ The data collection period began January, 2004 and ended August, 2004.

Settings and Samples

A convenience sample of subjects was obtained at two university hospitals located in Seoul, a capital city in Korea. Inclusion criteria were 1) 18 years of age or older, 2) diagnosed with CVD, including coronary heart disease (angina pectoris, unstable angina, or myocardial infarction), heart failure, valve abnormalities, or peripheral vascular disease, 3) a history of tobacco use within the past month, and 4) hospitalized in a cardiology units. Exclusion criteria included the following, 1) unable to speak, read or write Korean; 2) presence of concurrent psychiatric problems such as dementia or schizophrenia or diminished consciousness; and 3) medically unstable. Medically unstable patients were excluded because of the potential subject burden of participation with the interview. Data were collected after approval was obtained from the Committee of Human Research of University of California San Francisco, U.S.A and the chairs and medical staffs at cardiology departments of two Korean hospitals.

Instruments

Data were collected using a structured questionnaire and medical record abstraction. The instruments were available only in English. Therefore, the instruments required translation into Korean; after translation and independent back translation considering language and cultural meanings. The Korean version of the instrument was pre-tested in a small group to evaluate the feasibility of the questionnaire in terms of comprehension, length of time for administration and acceptance of the interview. Interviews were well conducted and no major change was made.

Demographics collected in the study included age, gender, level of education, marital status, employment status, monthly family income and admission diagnoses.

Information about *cardiovascular risk factors* was obtained primarily from medical records and further completed by information from self-reports. This information included lipid abnormalities, hypertension, diabetes, body mass index (BMI), and physical activity. To assess physical activity, questions the Behavioral Risk Factor Surveillance System (BRFSS),¹⁵ and the Centers for Disease Control and Prevention¹⁶ were used. *Psychosocial risk factors* were those factors that might be psychosocially affecting CVD and smoking use. These included history of psychiatric problems, alcohol use [current drinking status, amount of alcohol consumption per month, and alcohol

dependence (CAGE¹⁷), depression [the Center for Epidemiologic Studies Depression Scale (CES-D)],¹⁸ perceived stress [the Perceived Stress Scale (PSS)],¹⁹ and social support [the Enhancing Recovery in Coronary Heart Disease (ENRICH) Social Support Inventory (ESSI)].²⁰ *Smoking history* was obtained from self-reports. Smoking history included age of starting smoking, number of years smoked regularly, pack-years, number of cigarettes smoked per day, time to first cigarette in the morning,²¹ serious quitting attempts made in the past (serious quitting is defined as: staying free from smoking for at least for one day), and violation of hospital smoking ban during the index hospitalization. The detail information about the measurements for these variables is presented at else where.¹⁴

Smoker's Beliefs about the Health Benefits of Quitting Smoking

Smokers' beliefs about the health benefits of smoking cessation were assessed by asking three questions developed and tested on more than 4000 smokers by the National Cancer Institute's Community Intervention Trial for Smoking Cessation in the USA in 1989²² and three additional questions. The questions were "How likely do you think it is that you will avoid or decreased the severity of your health problems if you quit?" Response options included a range of answers from 1 = very likely to 5 = very unlikely; "If a person has smoked for more than 20 years, there is little benefit to quitting. Do

you?” 1 = strongly disagree to 6 = strongly agree, and “My smoking is harming my health. Do you?” 1 = strongly disagree to 6 = strongly agree. The additional three questions were “How likely do you think it is that you will avoid or decrease your chances of the development of lung cancer?” 1 = very likely to 5 = very unlikely, “How likely do you think it is that you will avoid or decreased the development of heart diseases?” Response options were 1 = very likely to 5 = very unlikely, and “How likely do you think it is that you will avoid or decrease the development of respiratory diseases?” Responses include: 1 = very likely to 5 = very unlikely.

Needs for future smoking cessation

Needs for future smoking cessation were evaluated through the questions used by Taylor²³ and Sivarajan Froelicher’s.²⁴ However, the options for answer of *reasons behind the intention to quit smoking* and *preferred quitting method for future quit attempt* were modified based on the documented information in Korean literature.^{12, 25-28} *Intention to participate in smoking cessation program during hospitalization* was developed by the authors.

The intention to quit smoking was measured through the question, “do you intend to stay off cigarettes or other tobacco products in the next month?” Subjects responded with a 7-point scale (1=definitely no to 7=definitely yes).

Reasons behind the intention to quit smoking were also evaluated “what is your reason that you want to quit smoking?” Various reasons, which were reported in previous literature, were provided and the subjects were asked to choose all that applied.

The confidence in quitting smoking was measured using a single-item self efficacy scale adopted from the previous studies, “how confident are you that you will be able to stay off cigarettes once you are discharged from the hospital?”^{24,29} This was measured on a scale with score rating ranging from 0 (not at all confident) to 10 (totally confident).

Preferred Quitting method for future quit attempt was asked using a question “if you were to consider stopping smoking, which methods would you want to try?” Various methods, which were reported in previous literature and often used medical service in Korea, were provided and the subjects were asked to choose all that applied.

Intention to participate in the smoking cessation program during hospitalization was asked using a question, “If a program were offered by the hospital, would you want to attend any type of education or program for smoking cessation? Subjects were asked to answer with “yes” or “no.”

Procedure

Before approaching potential subjects, medical and nursing personnel in the units

were informed of the study and its purpose at staff meetings. Staff nurses then assisted in recruitment for the study by informing potential subjects about the study. The researcher then contacted all interested subjects. The potential subject was given an overview of the purpose of the study. To verify the subject's smoking status, the researcher asked directly whether or not the subject had smoked during the last month. The researcher also explained the study to the subject, and answered any questions. When the subject was ready to be enrolled, written informed consent was obtained. The data collector for this project is a native Korean nursing researcher, and all interviews were conducted in Korean.

Data Management and Analysis

The SPSS, version 11.0 was used for analysis. Descriptive statistics and distribution of variables were evaluated for any data entry errors and for any discrepancies verified by the original, raw data.

To describe the study population, knowledge, attitudes, beliefs about smoking cessation and perceived needs for future smoking cessation intervention, actual numbers for frequency, mean with standard deviation, median with range and proportion were used.

To determine potential predictors of confidence in quitting smoking, variables that

were statistically significant in previous literature and in univariate analysis were defined.

Once defined, the variables were evaluated using multiple logistic regression for their independent effects. The results are presented with odds ratio (OR) with a 95% confidence interval (CI).

Results

The study sample included 97 men, with a mean age of 54.1 (\pm 9.6) years (Table 4.1). Most of the men (74.2%) had graduated high school or more; 85.6% were married; 77.3% were employed full time; and the median category of family income for these men was 2,500 – 2,999 thousand won (\$ 2,080 - \$2,499) per month. All of the men were hospitalized with CVD and they had multiple CV and psychosocial risk factors. Their smoking history is also presented in Table 4.2. A detail description of CV and psychosocial risk factors and smoking history was presented elsewhere.¹⁴

Smoker's Beliefs about the Health Benefits of Quitting Smoking (Table 4.3)

Most of men (84.5%) believed that they would avoid or decrease serious health problems if they quit smoking and many men (77.3%) agreed that smoking was harmful to their own health directly. Slightly smaller proportion of men (71.1%) knew of the benefit of quitting smoking even for those who had smoked for more than 20 years.

When the men were asked about the impact of smoking on three tobacco related

diseases (respiratory disease, heart disease, and lung cancer), most of men (86.6%) believed that they could avoid or decrease their chance of getting respiratory disease if they quit smoking. However, fewer men (78.3%) believed quitting smoking would avoid or decrease the chance of getting heart disease, and even a lower proportion of men (66.0%) believed that they would avoid or decrease the chance of getting lung cancer if they quit smoking.

Needs for future smoking cessation (Table 4.4 and Table 4.5)

Almost all of the subjects (92.7%) reported that they intended to quit smoking in the next month (Table 4.4). The most common two reasons to quit smoking were “for my health” and “bad smell on my body or hair.” Other reasons such as family’s or colleague’s health, home or work place smoking ban, increased price and decrease taste were asked about, but no one selected those options. More than half of the men (54.4%) reported absolute confidence in their ability to stop smoking with score of 10.

Comparison of quitting methods used during past quitting attempts and the methods the men reported they would use for future smoking cessation is presented at Table 4.5. The most common methods the men used in the past was “my own way” (52.9%), followed by cigarette supplement (17.1%), snacks (15.7%) and nicotine replacement therapy (NRT) (14.3%). For future smoking cessation, most of the men (87.8%) reported

their plan to quit on their own, only few people indicated they would try specific quitting methods. There was no statistically significant association between level of addiction (time to first cigarette in the morning) and trying NRT for past quit attempt and for future smoking cessation.

Over half of the men were willing to participate in formal education or a program for smoking cessation, if those programs were available during hospitalization (Table 4.6). Among 40 who said that they did not want to participate in such programs, the most common reasons (60%) of not wanting to participate was because the most important thing for smoking cessation was strong personal will and they could quit by themselves. The second reason was that the class would not have more useful information than what they already knew (22.5%). Only 5% of 40 said that they were not interested in programs or education for smoking cessation at all.

Predictors of confidence in quitting smoking (Table 4.7)

Through literature review and univariate analysis, five variables were identified as significantly associated with confidence in quitting smoking; age, level of education, marital status, CAGE and age of starting smoking. Using a multiple logistic regression including 5 variables, we found three independent variables which provided statistically significant independent contributions to the prediction of outcome. Married (OR: 5.54,

95% CI: 1.33, 23.08), higher score of CAGE (OR: 3.25, 95% CI: 1.20, 8.80), and starting smoking at early age (OR: 2.96, 95% CI: 1.14, 7.68) are statistically significant independent predictors of confidence in quitting smoking in a model evaluated with 5 variables.

To evaluate the effects of any other associated variables on the outcome variable, the variables highly associated with independent variables in univariate analysis were tested with the model. Total amount of alcohol consumption per month was entered into the model replacing the CAGE; and pack years and time for the first cigarette in the morning were entered separately into the model instead of age of starting smoking. In addition to these, depression (Center for Epidemiologic Studies Depression Scale, CES-D),³⁰ perceived stress (Cohen's Perceived Stress Scale, PSS)¹⁹ and social support (the Enhancing Recovery in Coronary Heart Disease [ENRICHD] Social Support Inventory, ESSI)²⁰ were entered separately in to the model and tested. However, none of these variables were statistically significant in the model.

Discussion

In the U.S., studies have been conducted about smoking in patients with CVD because of their vulnerability to the hazards of smoking and the immense benefit from smoking cessation.^{31-33 34-38} It has also been accepted that smoking cessation is not only

one of the single most important and preventable risk factor for CVD, but also an important intervention for people who already have diagnosed CVD.³⁹ According to Daly et al,³⁹ mortality in those who continued to smoke was significantly higher (82.1%) than in those who stopped smoking (36.9%) during 13 years of follow-up period after patients' first episode of unstable angina or myocardial infarction.³⁹ Deckers et al.⁴⁰ also found that smoking cessation among patients with newly established coronary heart disease reduced 1 year mortality by almost 40% and smoking cessation after the first MI reduced the risk of recurrence by 50%.³²

The men in this sample were very knowledgeable about the health hazards of smoking related diseases (respiratory disease, CVD, and lung cancer). Most of the men (92.8%) reported that they intended to quit smoking in the month after hospital discharge and two-third of these men (74.4%) reported moderate to high confidence in their ability to quit smoking. From this fact, we observed two interesting points. One is that around 30% of the men disagreed about benefit of quitting smoking for smokers who smoked for more than 20 years and interestingly, these men mostly have already smoked for more than 20 years (the mean year of their regular smoking was 33 years). These men seem to have misconception that they have smoked too long time to get health benefit and this misconception needs to be corrected in educational efforts. Second, almost all of the men

had intention to quit smoking in the next month after hospital discharge, but why 21% of the men still smoked during index hospitalization. The part of the reason could be they are denying their low intention to quit smoking under the pressure of “social desirability,” but it also reflects that they have nicotine addiction and need special intervention to overcome it.

Although these men were highly motivated to quit smoking, they were not active in seeking a successful quitting method for themselves. About half of the men (52.9%) said that they tried quitting by themselves without any specific method and more men (87.8%) said that they would quit by themselves without any help for future smoking cessation. No one reported that they would attend a smoking cessation program or education for future smoking cessation and this is consistent with the previous studies noting that many intensive group smoking cessation programs are offered, but most smokers prefer to quit on their own.^{41 42} This is confirmed by the fact that most of the quitting methods the men had tried in the past quit attempts were not preferred for their future smoking cessation. The proportion of the men who tried cigarette supplement, snacks, NRT and acupuncture decreased almost in half for their future smoking cessation. It seems that these men were not satisfied with the methods they used and once they were disappointed by previous quitting experience with these methods, they decided to quit by themselves for future

smoking cessation rather than trying other specific methods. However, the reason for failure in earlier quit attempts is usually not the method people used, but the natural characteristic of nicotine addiction. Thus, it is necessary to encourage people to understand that NRT is a reliable method to overcome this addiction when NRT is used with behavioral modification.⁴³ An urgent need exists to educate people that smoking is addictive and special smoking cessation methods will increase their permanent cessation efforts.

Another interesting finding is that quite a large proportion of the men (12.2%) reported that they used NosmoQ and they would use it again (4.4%) for future smoking cessation. NosmoQ is an herbal cigarette made with *Ucommia Ulmoides* leaves produced by a Korean company. The shape of the product is exactly like conventional filtered cigarettes and it was originally developed as a quitting aide. This product can be purchased without a prescription through the Internet, and it is sold in some pharmacies. In a previous study,⁴⁴ this product was the most frequently used quitting method among over 400 randomly selected adults in Seoul, Korea. *Eucommia Ulmoides* is an herb used for tea and herbal medication. Thus this product does not have any nicotine and the effect of this product as a quitting aide is assumed that this product provides the former smoker with a method to keep inhalation behavior like cigarette smoking, but they do not inhale

nicotine. Cheong⁴⁵ reported that this product is considered as effective as nicotine patches in short and long term effects on smoking cessation. This product was approved by Korean Food and Drug Administration as a non-pharmacological product. However, although this product does not include nicotine, the product produces carbon monoxide while it burns. In addition, data are not available about its potential harmful effects on patients with CVD. An urgent need exists to evaluate this potential problem as well as its effect on smoking cessation.

In contrast, when the men were asked if they would participate in smoking cessation program or education if the programs were available during index hospitalization, more than half of men (51%) said that they were willing to do that. This fact shows how hospitalization could potentially take the opportunity to use the teachable moment for smoking cessation in these patients. Emmons and Goldstein^{42, 46} documented hospital admission as a “teachable moment,” meaning it is an ideal time to offer a smoking cessation intervention and that it is more likely to be effective in terms of permanent cessation. When patients confront a serious illness and the possibility of death, they have a heightened level of motivation for changing risky behaviors. This increased level of motivation can maximize the effect of the smoking cessation interventions.

During hospitalization, the close relationship between a patient and his or her

health care providers creates a deep mutual understanding between them, and maximizes the effects of health care services. In addition, hospitalization provides sufficient time and close evaluation of patient care. It is well known that continuous contact and spending adequate time with patients is essential to make the most effective use of a smoking cessation program.⁴⁷ In this context, hospitalization could be the best chance to help patients feel satisfied with these supportive factors. Despite these obvious strengths, actual health care practice does not employ these features in Korea. Kim et al⁴⁸ reported that of the Korean hospitals surveyed (43 tertiary hospitals and 118 general hospitals), only 32 % of tertiary hospitals and only 13 % of general hospitals had any type of smoking cessation program available through their institution.

The smoking ban is in place in many hospitals and provides another good opportunity for patients to quit smoking. For many smokers, the time they spend in the hospital is often the longest time they have endured without smoking since they started smoking, and most report a serious interest in quitting smoking.^{42, 49-52}

Smoking bans in hospitals have become more common in Korea since a national law was passed in 1995 to limit smoking in public places including hospitals. Kim et al.⁴⁸ reported that 89.3% of tertiary hospitals and 73.6% of secondary or primary care hospitals now have smoking bans in their facilities. However, having a hospital smoking

ban does not guarantee that all hospitalized patients comply with the smoking restriction policies, nor does it ensure that patients quit smoking during their hospitalizations, or that it is strictly enforced. Smoking rates during hospitalization of smoker patients hospitalized with various diagnosis were 25% in two U.S. studies^{53, 54} and 35% in a Korean study.²⁶ In our study, smoking rate among these men was 21.6%.¹⁴ Further exploration about this population will help to design proper smoking cessation programs for this population.

This study has several limitations. First, this study used a cross sectional study, thus precluding causal association is not appropriate. Second, generalizability is limited, because this study failed to recruit women; this could be due to a low smoking prevalence in women; or the social undesirability of women smoking in this age group. In addition, men were also enrolled using a convenience sample limiting generalizability. Third, since data were collected during hospitalization and patients were under medical supervision, patients' high intention to quit smoking might come from "socially desirable answer," and we did not assess their actual quitting attempt after hospital discharge. Although intention to quit smoking during hospitalization has been highly associated with smoking cessation in the U.S. population, the association could be different in Korean population. Thus, future research on this issue could be valuable.

Despite these limitations, this study presents several important conclusions. This is the first study to address knowledge, attitudes and beliefs about smoking among Korean men hospitalized with CVD and their perceived needs for future smoking cessation interventions. Korean men who are smokers and hospitalized with CVD were very much aware of the health hazard of smoking related diseases and they were highly motivated to quit smoking. They were not interested in receiving intervention in their smoking cessation efforts, but preferred to quit by themselves without any help. They would be willing to participate in a smoking cessation program, if the program were made available during their hospital stay.

Based on these conclusions, we recommend several suggestions for practice and future research. Clearly, the findings of this study suggest that patients should be educated that smoking is addictive and special intervention is needed for most people to address the addiction. Health care providers need to provide smoking cessation interventions actively for this population and especially, programs for hospitalized patients seem to have great potential benefits. For that, proper education and training for health care providers is needed in Korea.

Future research also needs to involve women smoker patients in Korea. Special attention is needed to enroll women patients. To expand knowledge of natural history of

smoking behavior in this population and also minimize the effect of socially desirable response, follow-up study with biochemical verification could be valuable. Lastly, the harmful effects as well as benefits of smoking supplement as a quitting aide should be evaluated for patients with CVD.

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Table 4.1 Frequencies of demographics, admission diagnoses, CV risk factors and psychosocial risk factors (n=97, all Korean men)

	%	n
Demographics		
Age	Mean 54.1 (\pm 9.6), Range: 29-76))	
High school graduate or more	74.2	72
Married	85.6	83
Full time employed	77.3	75
Family income/month ¹	Median category: ₩ 2,500,000 – 2,999,000 (\$ 2,080 - \$2,499)	
Admission diagnosis²		
Myocardial infarction	23.7	23
Angina or chest pain	21.6	21
Unstable angina	20.6	20
CV risk factors²		
Physical inactivity (no exercise at all)	58.8	
Hypertension	46.4	45
Body Mass Index (BMI)		
Over weight ($25 \leq$, <30)	39.2	38
Obesity ($30 \leq$)	5.2	5
Diabetes Mellitus	28.9	28
Hyperlipidemia	23.7	23
Psychosocial risk factors		
History of psychiatric problem	1.0	1
Do you drink alcohol? Yes	59.8	58
CAGE score (n= 58): 2 or more	32.0	31
Depression (CES – D): \geq 16	17.5	17
Perceived stress (Cohen’s Perceived Stress Scale, 14 item)	Mean: 19.7 (\pm 7.0), Range: 0-47	
Social support (ESSI, 7item)	Mean: 27.6 (\pm 6.3), Range: 8-34	

In Korean Won at 2004 (in U.S. Dollars at 2004). \$ 1 is equivalent to ₩ 1,200¹; Not mutually exclusive²

Table 4.2 Smoking history

	%	n
Age of starting smoking	Mean: 19.9 (\pm 4.5), Range: 10 – 35	
Number of years smoked regularly	Mean: 33.0 (\pm 11.0), Range: 5 – 58	
Pack years	Mean: 42.4 (\pm 29.3), Range: 5 – 180	
Number of cigarettes smoked per day	Mean: 22.3 (\pm 16.6), Range: 2 – 100	
Time to first cigarette in the morning: \leq 30 minutes	64.9	63
Serious quit attempt in the past? Yes	72.2	70
Violation of hospital smoking ban during index hospitalization	21.6	21

Table 4.3 Smoker's beliefs about the health benefits of quitting smoking (n=97)

	%	n
How likely do you think it is that you will avoid or decrease serious health problems if you quit smoking?		
Very likely or likely	84.5	82
Very unlikely or unlikely	12.4	12
Uncertain	3.1	3
My smoking is harming my health. Do you ~?		
Strongly agree or agree	77.3	75
Strongly disagree or disagree	13.4	13
Neither disagree nor agree or I do not know	9.3	9
If a person has smoked for more than 20 years, there is little benefit to quitting. Do you ~?		
Strongly disagree or disagree	71.1	69
Strongly agree or agree	14.4	14
Neither disagree nor agree or I do not know	14.4	14
How likely do you think it is that you will avoid or decrease the chance of getting respiratory diseases if you quit smoking?		
Very likely or likely	86.6	84
Very unlikely or unlikely	6.2	6
Uncertain	7.2	7
How likely do you think it is that you will avoid or decrease the chance of getting heart disease if you quit smoking?		
Very likely or likely	78.3	76
Very unlikely or unlikely	7.2	7
Uncertain	14.5	14
How likely do you think it is that you will avoid or decrease the chance of getting lung cancer if you quit smoking?		
Very likely or likely	66.0	64
Very unlikely or unlikely	15.5	15
Uncertain	18.5	18

Table 4.4 Intention to quit smoking and confidence in quitting smoking

	%	n
Intention to quit smoking in the next month (n=97)	Mean 6.4 (\pm 1.4) Median 7.0 (range: 1– 7) ¹	
1, 2, 3 (Definitely no, probably no, or possibly no)	7.3	7
4, 5, 6 (Maybe yes, possibly yes, or probably yes)	9.2	9
7 (Definitely yes)	83.5	81
Reasons behind the intention to quit smoking (n=90) ²		
For my health	95.6	86
Bad smell on my body or hair	5.6	5
Others ³	6.7	6
Confidence in quitting smoking (n= 90)	Mean 8.1 (\pm 2.6) Median 10.0 (Range: 1– 10) ¹	
< 7	25.6	23
7 \leq , < 10	20.0	18
= 10	54.4	49

The data are not normally distributed. Therefore both mean with standard deviation and median with range is presented¹; Not mutually exclusive²; Others: Bad smell within the house (1), fear of more addiction (1), my wife or girlfriend dislike smoking (2) and people's negative attitude against smokers (2)³

Table 4.5 The comparison of quitting methods of past quitting attempts and the methods the men would use for future smoking cessation

Quitting method	Used for past quit attempts (n=70) ¹		Will try for future smoking cessation (n=90) ²	
	%	n	%	n
My own way	52.9	37	87.8	79
Cigarette supplement (Nosmo Q)	17.1	12	4.4	4
Snacks including candy, gum or traditional Korean snack ³	15.7	11	4.4	4
NRT including nicotine gum and patch	14.3	10	4.4	4
Time to first cigarette ≤30 min (n=58)		7		3
Time to first cigarette > 30 min (n=32)		3		1
		$\chi^2 = 0.15$ $p = 0.70$		$\chi^2 = 0.20$ $p = 0.65$
Acupuncture	7.1	5	2.2	2
Smoking cessation program or education	5.7	4	0.0	0
Others	5.7	4 ⁴	2.2	2 ⁵

Among men who tried at least one serious quitting attempt in the past¹; among men who had intention to quit smoking²; Traditional Korean snacks are mostly dried bean or dried rice which have very low calorie³; Others: Empty pipe (1), reading (1), medication (1), and watching movie (1)⁴; Others: Internet based self help service (1) and decreasing number of cigarette smoked per day (1)⁵

Table 4.6 Intention to participate to smoking cessation program during hospitalization

	%	n
Do you want to participate to formal education or program for smoking cessation during hospitalization if available? Yes	50.5	49
Why not? (n= 40)		
The most important thing is strong personal willingness to quit smoking and I can quit by myself	60.0	24
The class will have no more useful information I already know most about smoking	22.5	9
Just not interested in it at all	5.0	2
Other ¹	12.5	5

Others: I already quit (2), Hearing about smoking will make me want to smoke (1), I am to weak to attend the class (1), and I feel that attending class makes my confidence be weaker (1) ¹

Table 4.7 Odds Ratio (OR) with 95% Confidence Interval (CI) using multiple logistic regression analysis with 5 independent variables to predict the “confidence in quitting smoking” (outcome variable) ¹

Predictor variables ²	OR	95% CI. for OR	P-vale
Age (≥ 54 y)	0.98	0.40, 2.41	0.96
Education (< high school)	0.77	0.28, 2.13	0.61
Marital status (married)	5.54	1.33, 23.08	0.02
CAGE (≥ 2)	3.25	1.20, 8.80	0.02
Age of starting smoking (≤ 20y)	2.96	1.14, 7.68	0.03
Constant	0.08		<.005

The outcome variable was coded as 1: low confidence (< 10), 0: high confidence (= 10) ¹;
 Comparisons: Age (<54 y); Education (\geq high school); Marital status (not married);
 CAGE (<2); Age of starting smoking (>20y)²

Chapter 5

Executive Summary

This is the first study of smoking behavior in men hospitalized with CVD in Korea. It has been accepted that smoking cessation is not only one of the single most important and preventable risk factors for CVD,¹ but also a critically important intervention for people who already have diagnosed CVD.²

The men of this study were all smokers, hospitalized patients with CVD, and were required to obey the hospital smoking ban policies. These men were middle aged, well educated, married, and employed full time.

Sixty-five percent of men were addicted to nicotine. Three variables were statistically significant predictor variables of nicotine addiction: lower education (OR: 3.26, 95% CI: 1.03, 10.39), starting smoking at early age (OR: 3.30, 95% CI: 1.14, 9.50), and smoking more than 20 cigarettes per day (OR: 7.27, 95% CI: 1.48, 35.83).

Twenty-two percent of men violated the hospital smoking ban and this was statistically significantly associated with their intention to quit smoking (OR: 0.09, 95% CI: 0.03, 0.31).

For patients who still smoke during hospitalization, it is important to assist them in **re**fraining to smoke because their smoking in acute critical condition is dangerous to their **he**alth. For patients who abstain from smoking, health care providers need to recognize

that these patients are admitted to hospitals, and they have already spent several days without smoking, relapse prevention interventions need to be provided to aid patients in the avoidance of relapse to smoking upon their return home. For patient's who do not wish to quit at this time they need to be encouraged to contact their health care providers when they do feel prepared to quit.

Mostly, they were knowledgeable about the benefits of quitting smoking; intended to quit smoking after discharge (92.8%); and had high confidence to quit smoking (74.4%). Being married (OR: 5.54, 95% CI: 1.33, 23.08), having a higher score of CAGE (OR: 3.25, 95% CI: 1.20, 8.80), and starting smoking at earlier age (OR: 2.96, 95% CI: 1.14, 7.68) were statistically significantly associated with confidence to quit smoking.

Two contradictory phenomena were observed. First, the men reported being highly motivated to quit smoking, but they were not interested in receiving an intervention for their smoking cessation efforts, but preferred to quit by themselves without any help. Second, no men reported they would participate in smoking cessation program after discharge, but half of the men were willing to participate in a smoking cessation program if available during their hospitalization.

Based on our study findings, we recommend several suggestions for practice and future research. Clearly, the findings of this study suggest that every smoker needs to be

identified in order so that all relevant health care providers can have the opportunity to reinforce the “quit smoking message;” patients should be educated that smoking is addictive and special intervention is needed for most people to be successful with quitting smoking. Korean health care providers need to provide smoking cessation interventions actively for this unique population and especially, programs for hospitalized patients seem to have potential major benefits. For that, proper education and training for health care providers is needed in Korea.

Future research needs to include women smokers in Korea, but special attention is needed to enroll women patients since it is observed that enrollment of women smoker patients is extremely difficulty. To expand knowledge of natural history of smoking behavior in this population and also minimize the effect of socially desirable response, follow-up study with biochemical verification would be invaluable for proper scientific rigor of the studies..

References

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For reference

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