

# UCSF

## UC San Francisco Previously Published Works

### Title

Knowledge and beliefs about smoking and goals for smoking cessation in hospitalized men with cardiovascular disease

### Permalink

<https://escholarship.org/uc/item/60b1s995>

### Journal

Heart & Lung, 42(2)

### ISSN

0147-9563

### Authors

Elshatarat, Rami Azmi  
Stotts, Nancy A  
Engler, Marguerite  
[et al.](#)

### Publication Date

2013-03-01

### DOI

10.1016/j.hrtlng.2012.11.010

Peer reviewed



Published in final edited form as:

*Heart Lung*. 2013 ; 42(2): 126–132. doi:10.1016/j.hrtlng.2012.11.010.

## Knowledge and Beliefs about Smoking and Goals for Smoking Cessation in Hospitalized Men with Cardiovascular Disease

Rami Azmi Elshatarat, RN, MSc, PhD<sup>a,b</sup>, Nancy A. Stotts, RN, EdD<sup>c</sup>, Marguerite Engler, RN, PhD<sup>c</sup>, and Erika Sivarajan Froelicher, RN, MPH, PhD<sup>c,d</sup>

<sup>a</sup>Formerly: Department of Physiological Nursing, School of Nursing, University of California, San Francisco, California

<sup>c</sup>Department of Physiological Nursing, School of Nursing, University of California, San Francisco, California

<sup>d</sup>Department of Epidemiology and Biostatistics, School of Medicine, University of California, San Francisco, California

### Abstract

**Objectives**—To describe perceptions of smoking in men hospitalized with cardiovascular disease (CVD).

**Background**—Smoking is a major risk factor and associated with the high prevalence of CVD in Jordan.

**Methods**—The study design was cross-sectional with a convenience sample. A structured interview was conducted in 112 men who were hospitalized with CVD.

**Results**—The study showed that 91% of men with CVD smoked daily. The majority (83%) had attempted to quit smoking in the past without help from others, and intended to quit in the future using the same previous unsuccessful methods. They were unaware of the hazards of smoking such as CVD and stroke; or the long term health benefits of quitting smoking. Logistic regressions showed that men were more confident in quitting smoking if they had a high income (OR: 7.7, 95% CI: 2.7,22.3), longer hospitalizations (OR: 2.6, 95% CI:1.3,5.3), or were hospitalized in acute cardiac settings (OR:3.9, 95% CI:1.2,12.7), and CVD (OR:3.0, 95% CI:1.1,8.3).

**Conclusion**—Assessment of smoking status with smoking cessation counseling is paramount in hospitalized men with CVD who smoke.

### Keywords

Cigarette Smoking; Water pipes; Confidence; health benefits; Middle East

---

Corresponding Author: Rami Azmi Elshatarat, RN, MSc, PhD., Department of Adult Health Nursing, School of Nursing, AL-Ghad International Colleges of Health Sciences. Al-Madinah Al-Munawara Branch, Kingdom of Saudi Arabia, Phone: +966 4 8224841. Ex: 115, Fax: +966 4 8224605, elshatarat@hotmail.com.

<sup>b</sup>Currently: Department of Adult Health Nursing, School of Nursing, AL-Ghad International Colleges of Health Sciences, Al-Madinah Al-Munawara Branch, Al-Madinah Al-Munawara, Kingdom of Saudi Arabia

## Introduction

Tobacco use is the most preventable cause of death worldwide.<sup>1</sup> Of the approximately 1.2 billion smokers in the world, about half will die from diseases caused by smoking.<sup>2</sup> Tobacco use causes at least one quarter of all deaths from heart disease worldwide.<sup>3</sup> In Jordan, cardiovascular disease (CVD) is the leading cause of death and accounts for 38.2% of all deaths.<sup>4</sup> In the Middle East, cigarette smoking, diabetes mellitus, hypertension, and hyperlipidemia are the most prominent risk factors for CVD.<sup>5</sup>

Globally, one third of all men are smokers.<sup>3</sup> Tobacco is widely used worldwide due to low prices, aggressive and widespread marketing, people's lack of awareness of its adverse health effects, and inconsistent tobacco control policies. In Jordan, smoking is a growing problem as approximately 61.7% of men and 7.9% of women smoke. This is the highest prevalence of smoking tobacco among all Middle Eastern countries.<sup>6</sup> In addition, people in Jordan spend about \$350 million annually on tobacco products.<sup>7</sup>

Jordan was one of the first countries in the Middle East to introduce anti-smoking regulations. The Health Law of Jordan that was passed in 1977 prohibits smoking in public and bans tobacco advertising. In 2001, Jordanian law imposed restrictions on the sale of tobacco to minors (less than 18 years old) as part of the Juvenile Monitoring Legislation.<sup>7</sup> Despite these laws, tobacco policies are not enforced.

Although Jordanians who smoke are at increased risk of CVD, no studies have investigated their knowledge, attitudes and beliefs about the hazards of smoking tobacco, the benefits of quitting smoking, or intentions to quit among smokers with CVD. The research about the knowledge, attitudes and beliefs about smoking in Jordan has been conducted in college students<sup>8-11</sup> and health care providers.<sup>12, 13</sup> The data cannot be generalized to patients with CVD because of differences in the populations studied. The prevalence of smoking by Jordanian university students is high.<sup>8-11</sup> These students lack knowledge about the health risks of smoking,<sup>8,11</sup> benefits from quitting smoking, and addictive properties of tobacco.<sup>11</sup> Data show students have tried to quit smoking but failed.<sup>10</sup>

To enhance smoking cessation rates, combining pharmacological and non-pharmacological therapy is recommended.<sup>14</sup> Effective non-pharmacological therapy includes counseling, behavioral-educational therapy, health advice, and family support.<sup>14-16</sup> Self-efficacy has an important role in influencing and changing many adverse behaviors including smoking<sup>17</sup> and has a significant relationship with stopping tobacco use.<sup>18</sup> A statistically significant relationship exists between confidence (self-efficacy), expressed as "willingness to make a serious quit attempt", and smoking cessation rates.<sup>19</sup> Moreover, high perceived self-efficacy levels predict an individual's success in quitting smoking<sup>17,19</sup> and the maintenance of smoking cessation at 6 months<sup>19,20</sup> and 12 months after smoking cessation.<sup>19</sup>

Increased smoking cessation rates, maintenance of quitting, and prevention of relapse are major goals of health care providers, particularly for patients with CVD. An array of approaches contribute to smoking cessation including teaching the public about the health risks of tobacco use, offering advice to quit smoking, enhancing individuals' confidence to

quit smoking, providing effective interventions, establishing smoking cessation programs, and enforcing smoking control policies.

To develop smoking cessation programs, it is critical to understand people's perceptions related to smoking. Health care providers need baseline information that includes smokers' demographic characteristics, knowledge and beliefs about smoking hazards, health risks, the benefits of quitting smoking, future intentions for quitting, confidence in the ability to stop smoking, and preferred methods for quitting.<sup>21</sup> Once these characteristics are known, smoking cessation education and strategies to quit smoking can be planned and implemented.

### **Research Purpose**

The purpose of this study was to describe the knowledge and beliefs about smoking of hospitalized men with CVD in Jordan and to identify the predictors of their confidence to quit cigarette smoking. The specific objectives of this study of hospitalized Jordanian smokers with CVD were to: 1) identify their knowledge, attitudes and beliefs about smoking; 2) identify their perceptions about the health benefits of smoking cessation; 3) identify patients' willingness to quit smoking; 4) evaluate their confidence in quitting smoking; 5) identify the smoking cessation methods that they used in the past to quit smoking; 6) identify smoking cessation methods those who intend to quit smoking plan to use in the future to quit smoking; and 7) identify the predictors of subjects' confidence to quit cigarette smoking. The findings will provide essential information needed to help establish smoking cessation programs for hospitalized patients with CVD and guide further clinical research.

### **Design and Methods**

A descriptive, cross-sectional study was conducted to describe the beliefs, knowledge and patterns of smoking of hospitalized Jordanian men with CVD and identify predictors of their confidence to quit smoking cigarettes. A convenience sample of Jordanian men hospitalized for CVD participated. The Committee on Human Research at the University of California, San Francisco approved this study as did the Directors of Nursing and the Chief Medical Officers of the two hospitals. All subjects provided written informed consent.

#### **Setting**

This study was conducted in two private hospitals in Amman, Jordan between October and November 2009. Each hospital provides a full range of cardiovascular medical and surgical services.

#### **Sample**

Study inclusion criteria were: (1) men who were 18 years of age; (2) hospitalized with a diagnosis of CVD, including angina pectoris, unstable angina, or myocardial infarction (MI), heart failure, arrhythmia, aortic aneurysm, and peripheral arterial disease as well as anyone admitted for a cardiac interventional procedure; (3) fluent in Arabic; (4) current smoker of cigarettes and/or water pipe, and (5) oriented to time, place and person at the time of the

interview. Subjects were excluded if they had a concurrent psychiatric disorder such as dementia or schizophrenia or were medically unstable. The nurses who provided care for the eligible subjects were asked to confirm that potential subjects were medically stable and oriented at the time of the interview.

### Data Collection Procedure

The principal investigator (RE) screened newly admitted patients to determine if they met the inclusion criteria. The patients who met the eligibility criteria were asked to participate in this study and informed consent was obtained prior to the start of the study. The principal investigator conducted face to face interviews using a structured questionnaire. Data also were abstracted from the medical record and included diagnosis on admission, height and weight, and length of stay.

### Measurements

The Global Adult Tobacco Survey (GATS) core was used with optional questions.<sup>22</sup> Additional items were included that focused on knowledge of health benefits of smoking cessation, willingness to quit smoking, and confidence to quit smoking.<sup>21, 23</sup> The GATS is part of the ongoing Global Tobacco Surveillance System (GTSS). The GATS is a nationally representative household adult tobacco survey. It was conducted in 16 low and middle-income countries, including Egypt and Turkey. The GATS includes content on the prevalence of cigarette smoking and other tobacco use, exposure to risk, second-hand smoke exposure and policies, smoking cessation, risk perceptions, knowledge, attitudes and perception, exposure to media, economics related to tobacco use, and a water pipe module.<sup>22</sup>

Six items listed in Table 3 were used to assess smokers' beliefs about the health benefits of smoking cessation. Items were scored on a Likert scale and used in previous studies.<sup>21, 23, 24</sup> Subjects' willingness to quit smoking and confidence in their ability to quit smoking were measured by items modified from previous studies.<sup>21, 25</sup> The questions were: "How willing are you to make a serious quit attempt of (cigarettes/water pipe) in the next month?" and "How confident are you that you will be able to quit smoking (cigarettes/water pipe) once you are discharged from the hospital?" The subjects response options ranged from 0 to 10 with anchors for quitting in the next month being "not at all willing" and "extremely willing" and for quitting once discharged being "not at all confident" and "totally confident."

The methods that had been used with quit attempts in the past and their preferred methods for quitting cigarette/water pipe smoking in the future were assessed by asking subjects to choose from examples of methods such as: "My own way without help from others," physical exercise, pharmacotherapy, snacks, counseling, educational materials, or smoking cessation programs.<sup>21</sup> Reasons for quitting smoking and determination of who considered giving up smoking was ascertained from Lader's study.<sup>26</sup> These items addressed better health in general, risk of smoking related illness, and present health problems.

The questionnaires were translated into Arabic and back-translated to English by an accredited translator who is an expert translator of behavioral and clinical studies. A pilot study with six eligible men with CVD from both hospitals was conducted to test the

acceptability and ease of use of the questionnaires. The men reported that the questionnaires were clear and that no language problems were encountered during the interview.

### Data Analysis

Data were entered into SPSS software (version 15) and de-identified. Descriptive statistics were completed for all variables. Means and standard deviations were calculated for continuous variables. Frequencies and percentages were calculated for categorical variables. Correlations were conducted between confidence to quit smoking and demographic variables, CVD and psychological risk factors, hospitalization variables, cigarette smoking pattern variables, and smoking customs variables in the subject's home. Those variables that were significant were included in the regression analysis. Multiple logistic regression was used to detect any association between selected independent variables and the outcome "confidence to quit cigarette smoking". The results are presented as odds ratios (OR) with a 95% confidence interval (CI).

Sample size was estimated prospectively based on the general rule for regression that 10–20 subjects are needed per variable.<sup>27,28</sup> Because there were five independent variables in the multiple logistic regression, a sample size of 112 subjects was sufficient.

### Results

A total of 112 men were recruited, enrolled, and completed the study. An additional 11 men declined to participate and three subjects did not complete the interview. Table 1 provides demographic and clinical data on the sample. Most of the men were middle-aged, married, employed, and had completed high school or higher levels of education. About 60% of the men had a monthly family income above average by Jordanian standards.<sup>29</sup> The majority of the men were interviewed in the Coronary Care Unit (CCU) and the most common diagnosis at admission was acute coronary syndrome. Cardiac catheterization and cardiac stent insertion were common procedures.

### Knowledge and Beliefs about Health Hazards of Smoking

Nearly all of the men (91.1%, n= 102) were daily cigarette smokers. Some (18.8%, n= 21) smoked water pipes and others smoked both cigarettes and water pipes 9.8% (n=11). Table 2 provides detailed data on their beliefs about the benefits of smoking cessation and the hazards of smoking. The majority of subjects believed that cigarettes could cause respiratory system diseases (e.g., asthma, chronic obstructive pulmonary disease), CVD, and lung cancer. Less than 40% of the participants were aware that cigarettes could cause a stroke or other bodily harm.

All of the water pipe smokers knew that water pipes could cause respiratory diseases and nearly all believed that water pipes could cause CVD. A large proportion believed that water pipe smoking could cause lung cancer and more than half believed it could cause a stroke. Less than half believed that water pipes did not cause other bodily effects.

In addition, the majority of the men believed that second hand smoke could cause serious illness in non-smokers. Most of them believed that second hand smoke could cause CVD and cancer in adults and lung diseases in children (data not shown).

### **Health Benefits of Smoking Cessation**

Table 2 provides data on participants' perceptions of the benefits of stopping smoking. Most cigarette and water pipe smokers believed that smoking was harmful to their health. Few described a benefit to stopping smoking after many years of being a smoker. However, most men believed that smokers would avoid or decrease serious health problems, avoid or decrease the chance of getting respiratory diseases, heart disease, and lung cancer if they quit cigarette/water pipe smoking.

### **Willingness to Quit Smoking and Confidence in Ability to Quit Smoking**

Table 3 shows data on men's willingness to quit smoking and their reported confidence in their ability to stop smoking after hospital discharge. On average, cigarette smokers were more willing to quit than water pipe smokers but rates generally were low. In addition, cigarette smokers' confidence in quitting smoking was greater than that of water pipe smokers. Levels of willingness to stop smoking and their confidence in their ability to stop smoking were similar.

### **Reasons for Quitting Smoking**

The men who were willing to quit smoking said their major reasons were present health problem, better health in general, doctor's advice, less risk of getting smoking related illness. Family pressure and harm to children also were noted. The ban on smoking in public places was not often cited (Table 4).

### **Quit Attempts**

In the past, the majority of smokers tried to quit smoking "on their own" without help from others (Table 5). More than half also decreased the number of cigarettes/water pipes. A few cigarette smokers had used a smoking cessation program, nicotine replacement therapy (NRT), counseling or educational materials. Water pipe smokers did not use NRT, medication, counseling, educational materials, or smoking cessation programs to quit smoking.

The men who indicated that they were willing to quit smoking in the future reported that they would use their "own way without help from others" to quit smoking (Table 5). Many more were willing to try counseling, educational materials or smoking cessation programs than those who had previously tried to quit. Few would consider NRT or prescription drugs.

### **Predictors of Confidence to Quitting Cigarette Smoking**

A multiple regression model was tested using the statistically significant associated variables from subset of univariate analysis (Table 6). This model included the predictor variables of monthly family income, subject's unit, subject's length of stay in hospital at time of interview, diagnosis on admission, age of onset of cigarettes smoking with the dependent variable self-efficacy (confidence) in quitting cigarette smoking after hospital discharge.

Table 6 shows that the statistically significant predictors were higher income, hospitalized in the CCU, ICU or post cardiac catheterization recovery at time of the interview, longer hospital stay, and admitted with a diagnosis of MI, stable angina or unstable angina.

## Discussion

This is the first study to assess knowledge and beliefs about smoking, perception of the benefits of quitting smoking, and the willingness and confidence of smokers to quit smoking in Jordanian men hospitalized with CVD. Tobacco use is a major modifiable risk factor for CVD and other health problems in the Middle East. Data from this study show lack of awareness about the adverse health effects of tobacco use and benefits from smoking cessation, especially long term smoking. The mistaken belief that water pipe smoking is less harmful than cigarettes is particularly concerning. Water pipe smoke contains similar or higher concentrations of carbon monoxide, nicotine, tar, and heavy metals than cigarettes, which contribute to the same adverse health consequences associated with cigarette smoking including malignancy, impaired pulmonary function, and low birth weight.<sup>30</sup> Cigarettes and other forms of tobacco are powerful “addictive drugs”.<sup>31</sup> Therefore, the Jordanian public needs to be educated about the hazards of tobacco use and the benefits of quitting smoking in order to limit tobacco use.

The majority of the subjects were aware of the relationship between cigarette and water pipe smoking and CVD and the harmful effects on the respiratory system. In addition, half of the men in this study believed that cigarette/water pipe smoking caused strokes but the majority of the men were unaware of the effect of cigarette/water pipe smoking on other body systems. These findings contradict those of an earlier study in the Middle East that reported that the lack of awareness of the hazards of smoking as a risk factor for increased tobacco use.<sup>9</sup> Other data on undergraduate students in Jordan show lack knowledge of the relationship between smoking and lung cancer.<sup>11</sup> In addition, primary health care patients in Amman, Jordan are unaware of the contribution of smoking to hypertension and stroke.<sup>8</sup>

The men who participated in this study were admitted to the hospital for serious CVD events or procedures. The majority had some knowledge of the harmful effects of smoking on their health and that smoking cessation would lower the risk for other serious health problems such as respiratory disease and lung cancer. These data are similar to Korean men hospitalized with CVD.<sup>21</sup> However, most of the men in this study had a serious lack of knowledge about the benefits of smoking cessation for people who have smoked for more than 20 years. In contrast, most of the Korean men<sup>21</sup> and American women<sup>19</sup> hospitalized with CVD knew that it was beneficial to stop smoking, even for long term smokers. The misconception among the Jordanian men about the lack of long term benefits from smoking cessation may support continued tobacco use and, in fact, cause them to not even try to quit smoking. Yet, there are documented long term benefits from smoking cessation. One year after quitting, the excess risk of CVD is half that of individuals who continue to smoke. Stroke risk is reduced to that of a non-smoker 5 to 15 years after quitting; and 15 years after quitting, the risk of CHD is the same as a non-smoker's.<sup>32</sup>



Hospitalization, specifically for a cardiac diagnosis, is a strong motivator for many people to quit smoking.<sup>21,33</sup> In the current study, more than 80% % of cigarette smokers and 70% of water pipe smokers were willing to quit smoking after hospital discharge. Yet patients were unrealistic in the methods they planned to use to quit. The majority of the men who had attempted to quit smoking in the past had used their “own way without help from others.” Moreover, none of the water pipe smokers and only about 30% of cigarette smokers used counseling, educational materials, or smoking cessation programs in the past. Even though using “their own method” is ineffective<sup>14</sup> and was unsuccessful, most of the men who were willing to quit smoking were insistent on using the same unsuccessful method in the future.

Tobacco dependence is an addiction and a chronic disease that requires systematic interventions.<sup>14,31</sup> One systematic approach is the “5 As” model for treating tobacco use and dependence (Ask all patients for tobacco use through systematic screening, Advise to quit, Assess willingness to quit, Assist with quitting, and Arrange follow up).<sup>14</sup> If the patient is willing to quit, the clinician should offer medication. Bupropion SR, varenicline, and NRTs, particularly nicotine patch, are effective or treating tobacco use for patients with CVD. NRTs should be used with caution among patients who are within 2 weeks after having experienced a myocardial infarction, those with serious arrhythmias, and persons with unstable angina pectoris.<sup>14</sup> Counseling or additional treatment based on the tobacco user’s needs also should be provided. Planned follow up to prevent relapse is needed.

In Jordan, there is no toll-free telephone quit line or smoking cessation support in hospitals. Although NRTs and varenicline are nonprescription drugs that are available in pharmacies and fully covered by national health insurance, these medication are not on the country’s essential drugs list.<sup>35</sup> A combination of education, counseling and smoking cessation medications are the most effective treatments to increase long-term cigarette smoking cessation in hospitalized patients.<sup>14</sup> However, to date there are no data indicating the best treatments to assist water pipe smokers to quit smoking. In this study, very few of the men who were willing to quit smoking reported that they planned to use pharmacological therapy to quit smoking.

Confidence in one’s ability to quit smoking is important in smoking cessation.<sup>17–19</sup> Although the majority of subjects in this study said they were willing to quit smoking, less than 60% were confident that they would actually be able to quit. In addition, they were less confident than Korean<sup>21</sup> or American hospitalized cigarette smokers with CVD.<sup>36</sup> Further work is needed to understand these differences.

Predictors of confidence to quit smoking from this study are higher family income, longer hospital stay, a CVD diagnosis, and being in ICU/CCU. These data are not consistent with those of hospitalized Korean men smokers with CVD where the predictors of confidence to stop smoking were not being married and having started smoking after age 20.<sup>21</sup> This suggests that predictors of confidence to stop smoking differ in geographic locations and/or by culture.

Being hospitalized with a critical illness is a major factor that enhances individuals’ confidence to quit smoking. Health care providers have to use the opportunity provided by

hospitalization of patients with CVD to enhance their confidence in their ability to quit smoking after they are discharged from the hospital.

### **Limitation and Strengths of this Study**

This cross-sectional study using a convenience sample has several limitations. The cross-sectional study design precludes statements about causality. The use of a convenience sample limits generalizability of the findings. Therefore, further confirmation using a random sample of Jordanian men who are hospitalized for a CVD diagnosis is needed. Jordanian women also need to be studied. While data indicate a smaller number of Jordanian women smoke, their knowledge and beliefs have not been studied and their influence on their male partners has not been addressed.

Despite the fact that the GATS has been used in 16 countries with the coordination of the WHO, no data have been published about the GATS psychometric properties. Moreover, because the data were collected during hospitalization while the subjects were acutely ill, the actual men's intentions to quit smoking may be different once they have recovered from the acute episode and return to their homes. Given the seriousness of their conditions, the hospitalized patients may have given socially acceptable answers on their questionnaires.

Despite the limitations of this cross-sectional study, it is the first to address the beliefs, knowledge and patterns of smoking in smokers hospitalized with CVD about smoking and health benefits of quitting in Jordan. This is particularly important in Jordan and other Arab countries where smoking rates and prevalence of CVD are very high. The results of this study provide important information that can be used to develop effective smoking cessation programs in Jordan and the Middle East.

### **Conclusion**

There is a knowledge deficit that may contribute to the beliefs about smoking in Jordanian men hospitalized with CVD. Because smoking is a major modifiable risk factor for CVD and morbidity and mortality from CVD is high in Jordan, attention needs to be given to education about smoking cessation. Smoking cessation needs to be identified as a major and urgent public health priority in Jordan and other Middle Eastern countries.

Health education is essential to correct knowledge deficits about the hazards of tobacco use. Since most of the men in this study started smoking before they were 18 years old (data not presented), public health education about the health hazards of smoking needs to be incorporated into school based education and should be an integral part of the health curriculum of elementary and secondary schools.

Pharmacologic therapy, counseling and cognitive behavioral therapy can enhance smoking cessation.<sup>14</sup> Improving self-efficacy enhances the individual's success in quitting smoking and preventing smoking relapses.<sup>23</sup> Teaching smokers about the benefits of smoking cessation and providing cognitive behavioral therapy and social support as part of treatment can motivate tobacco users to quit.<sup>14,15</sup>

Tobacco control policies in the hospital exist, but they are not enforced. A smoke free hospital environment must be created. Signs for smoking ban inside the hospital (patients' room, corridors, cafeterias, etc.) must be considered as an intervention to provide a smoke free environment in the hospital. Smoking by patients, families, visitors, and employees in the hospital is culturally accepted in Jordan. Prohibiting smoking inside the hospital must be enforced. Health care providers must be role models in the hospital. Health care professionals need to be educated about smoking cessation<sup>12, 13</sup> and not smoke in the hospital. Educating patients about the hazards of smoking and benefits of smoking cessation needs to become an integral part of health care providers' therapeutic arsenal.

Future studies are recommended that use random sampling methods and extend recruitment beyond the capital of Amman to improve the generalizability of the findings in Jordan. Additional efforts are needed to identify the reasons Jordanian men are reluctant to even consider quitting smoking. The knowledge and beliefs of Jordanian women about smoking also must be addressed. Subsequently, intervention studies using experimental designs are needed to determine the most acceptable and beneficial smoking cessation approach for all Jordanians.

## Acknowledgments

The authors thank Dr. Dianne Christopherson for her valuable suggestions on this paper, Dr. Steven Paul for his statistical consultation, and the Directors of Nursing and Chief Medical Officers of the Specialty Hospital and the Al-Esra Hospital who facilitated the conduct of this study in their settings. The authors also thank all the men who participated in this study. This study was partially supported by UCSF's: the Graduate Dean's Health Sciences Fellowship, an Osher Scholarship, a Century Club Fellowship, and the Graduate Student Research Award.

## References

- Centers for Disease Control and Prevention. Cigarette smoking among adults—United States. *MMWR*. 2007; 56:1157–1161. [PubMed: 17989644]
- Mackay, J.; Ericksen, M.; Shafey, O. The tobacco atlas. 2nd. Atlanta: American Cancer Society; 2006.
- World Health Organization. Smoking statistics. Geneva: WHO; 2002. Available at: [www.wpro.who.int/media\\_centre/fact\\_sheets/fs\\_20020528.htm](http://www.wpro.who.int/media_centre/fact_sheets/fs_20020528.htm)
- World Health Organization. Core Health Indicators. 2006. Available at: [http://www.who.int/whosis/database/core/core\\_select\\_process.cfm](http://www.who.int/whosis/database/core/core_select_process.cfm)
- Hammoudeh AJ, Al-Tarawneh H, Elharassis A, et al. Prevalence of conventional risk factors in Jordanians with coronary heart disease: the Jordan Hyperlipidemia and Related Targets Study (JoHARTS). *Int J Cardiol*. 2006; 110(2):179–183. [PubMed: 16233922]
- World Health Organization. WHO Report on the Global Tobacco Epidemic: The MPOWER package. Geneva: World Health Organization; 2008. Available at: [www.who.int/tobacco/mpower](http://www.who.int/tobacco/mpower)
- Ma'ayeh. Tobacco Control. WHO Tobacco Control Papers; 2003. Jordan: Mass media campaign combating smoking requires serious commitment and not just words. Available at: <http://repositories.cdlib.org/context/tc/article/1166/type/pdf/viewcontent>
- Al-Kayed A, Sawair A, Burgan S, Khraisat A. Health hazards of tobacco smoking: An alarming lack of public awareness. *Saudi Dental Journal*. 2005; 17(2):63–68.
- Haddad LG, Malak MZ. Smoking habits and attitudes towards smoking among university students in Jordan. *Int J Nurs Stud*. 2002; 39(8):793–802. [PubMed: 12379297]
- Khader YS, Alsadi AA. Smoking habits among university students in Jordan: prevalence and associated factors. *East Mediterr Health J*. 2008; 14(4):897–904. [PubMed: 19166173]

11. Kofahi MM, Haddad LG. Perceptions of lung cancer and smoking among college students in Jordan. *J Transcult Nurs*. 2005; 16(3):245–254. [PubMed: 15980052]
12. Shishani K, Nawafleh H, Jarrah S, Froelicher ES. Smoking patterns among Jordanian health professionals: a study about the impediments to tobacco control in Jordan. *Eur J Cardiovasc Nurs*. 2011; 10(4):221–227. [PubMed: 20826114]
13. Shishani K, Nawafleh H, Sivarajan Froelicher E. Jordanian nurses' and physicians' learning needs for promoting smoking cessation. *Prog Cardiovasc Nurs*. 2008; 23(2):79–83. [PubMed: 18843829]
14. Fiore, M. Treating tobacco use and dependence: 2008 update. Rockville, Md.: U.S. Dept. of Health and Human Services, Public Health Service; 2008. United States. Tobacco Use and Dependence Guideline Panel. 2008 update ed
15. Benowitz NL. Clinical pharmacology of nicotine: implications for understanding, preventing, and treating tobacco addiction. *Clin Pharmacol Ther*. 2008; 83(4):531–541. [PubMed: 18305452]
16. Hatsukami DK, Stead LF, Gupta PC. Tobacco addiction. *Lancet*. 2008; 371(9629):2027–2038. [PubMed: 18555914]
17. Badr HE, Moody PM. Self-efficacy: a predictor for smoking cessation contemplators in Kuwaiti adults. *Int J Behav Med*. 2005; 12(4):273–277. [PubMed: 16262546]
18. Froelicher ES, Kozuki Y. Theoretical applications of smoking cessation interventions to individuals with medical conditions: women's initiative for nonsmoking (WINS)-part III. *Int J Nurs Stud*. 2002; 39(1):1–15. [PubMed: 11722829]
19. Froelicher ES, Christopherson DJ, Miller NH, Martin K. Women's initiative for nonsmoking (WINS) IV: description of 277 women smokers hospitalized with cardiovascular disease. *Heart Lung*. 2002; 31(1):3–14. [PubMed: 11805744]
20. Boardman T, Catley D, Mayo MS, Ahluwalia JS. Self-efficacy and motivation to quit during participation in a smoking cessation program. *Int J Behav Med*. 2005; 12(4):266–272. [PubMed: 16262545]
21. Sohn M, Stotts NA, Benowitz N, et al. Beliefs about health, smoking, and future smoking cessation among South Korean men hospitalized for cardiovascular disease. *Heart Lung*. 2007; 36(5):339–347. [PubMed: 17845880]
22. Centers for Disease Control and Prevention. Global Tobacco Surveillance System (GTSS), Global Adult Tobacco Survey (GATS): Core Questionnaire with Optional Questions. 2008. Available at: [http://www.cdc.gov/tobacco/global/gats/questionnaire/pdfs/core\\_questionnaire.pdf](http://www.cdc.gov/tobacco/global/gats/questionnaire/pdfs/core_questionnaire.pdf)
23. Sivarajan Froelicher ES, Miller NH, Christopherson DJ, et al. High rates of sustained smoking cessation in women hospitalized with cardiovascular disease: the Women's Initiative for Nonsmoking (WINS). *Circulation*. 2004; 109(5):587–593. [PubMed: 14769679]
24. Centers for Disease Control and Prevention. Smokers' beliefs about the health benefits of smoking cessation-20 U.S. communities, 1989. *Morbidity Mortality Weekly Report*. 1990; 39:653–656. [PubMed: 2118979]
25. Froelicher ES, Christopherson DJ. Women's initiative for nonsmoking (WINS) I: design and methods. *Heart Lung*. 2000; 29(6):429–437. [PubMed: 11080324]
26. Lader, D. Omnibus Survey Report No. 36. Newport, UK: Office for National Statistics; 2007. Smoking-related behavior and attitudes: A report on research using the National Statistics Omnibus Survey produced on behalf of the NHS Information Centre for health and social care.
27. Long, JS. Regression models for categorical and limited dependent variables. Thousand Oaks: Sage Publications; 1997.
28. Polit, DF.; Beck, CT. Nursing research : principles and methods. 7th. Philadelphia: Lippincott Williams & Wilkins; 2004.
29. The Hashemite Kingdom of Jordan Department of Statistics. 2006. Available at: [http://www.dos.gov.jo/dos\\_home/dos\\_home\\_e/main/index.htm](http://www.dos.gov.jo/dos_home/dos_home_e/main/index.htm)
30. Knishkowsky B, Amitai Y. Water-pipe (narghile) smoking: an emerging health risk behavior. *Pediatrics*. 2005; 116(1):e113–e119. [PubMed: 15995011]
31. US Department of Health and Human Services. The health consequences of smoking: Nicotine addiction: A Report of the Surgeon General. Rockville, MD: US Department of Health and Human Services Publication; 1988.

32. The 2004 United States Surgeon General's Report: The Health Consequences of Smoking. N S W Public Health Bull. 2004; 15(5–6):107. [PubMed: 15543245]
33. Miller NH, Smith PM, DeBusk RF, Sobel DS, Taylor CB. Smoking cessation in hospitalized patients. Results of a randomized trial. Arch Intern Med. 1997; 157(4):409–415. [PubMed: 9046892]
34. Miller, W.; Rollnick, S. Motivational interviewing: preparing people for change. 2nd. New York: Guilford Press; 2002.
35. World Health Organization. WHO Report on the Global Tobacco Epidemic. Jordan: Country profile; 2011. Available at: [http://www.who.int/tobacco/surveillance/policy/country\\_profile/jor.pdf](http://www.who.int/tobacco/surveillance/policy/country_profile/jor.pdf)
36. Smith PM, Reilly KR, Houston Miller N, DeBusk RF, Taylor CB. Application of a nurse-managed inpatient smoking cessation program. Nicotine Tob Res. 2002; 4(2):211–222. [PubMed: 12096707]

**Table 1**

Demographic and Clinical Data on Jordanian Men Hospitalized with CVD (n=112)

<b>Demographics</b>	<b>Mean (SD<sup>*</sup>)</b>
Age (year)	52.5 (9.74)
	<b>n (%)</b>
<b>Marital Status, employment, income</b>	
Married	84 (75.0)
High school	76 (67.9)
Employed	71 (63.5)
Monthly family income : >400 JD <sup>†</sup>	68 (60.7)
<b>Clinical data</b>	
<b>Unit where interviewed</b>	
Coronary care unit (CCU)	65 (58.0)
Intensive care unit (ICU)	9 (8.0)
Cardiac catheterization recovery unit	5 (4.5)
Medical/surgical ward	33 (29.5)
<b>Patient's length of stay in hospital at time of interview</b>	
1 day	43 (38.4)
2 days	46 (41.1)
3 days	23 (20.6)
<b>Diagnosis on admission</b>	
Stable angina	27 (24.1)
Unstable angina	32 (28.6)
Myocardial infarction	18 (16.1)
Arrhythmia	9 (8.0)
Congestive heart failure	10 (8.9)
Others <sup>‡</sup>	16 (14.4)
<b>Invasive cardiac procedure or surgical intervention after admission</b>	
Cardiac catheterization	21 (42.9)
Stent insertion	17 (34.7)
Coronary artery bypass graft	9 (18.4)
Valve surgery	2 (4.1)

\* SD: Standard deviation.

<sup>†</sup> JD = Jordanian dinar (1 JD= \$1.40).

<sup>‡</sup> Cardiomyopathy, aortic aneurysm, coronary heart disease, valvular disease, endocarditis.

**Table 2**

Beliefs about the Health Benefits of Smoking Cessation and Hazards of Smoking\*

Beliefs	Cigarette smokers (n=103) n (%)	Water pipe smokers (n=21) n (%)
<b>Benefits of Smoking Cessation</b>		
How likely do you think it is that you will avoid or decrease serious health problems if you quit cigarette/water pipe smoking?		
Very likely or likely	91 (88.4)	19 (90.5)
My cigarette/water pipe smoking is harming my health.		
Strongly agree or agree	98 (95.2)	19 (90.5)
If a person has smoked cigarettes/ water pipes for more than 20 years, there is little benefit to quitting.		
Strongly disagree or disagree	34 (33.0)	6 (28.6)
How likely do you think it is that you will avoid or decrease the chance of getting respiratory diseases if you quit cigarette/water pipe smoking?		
Very likely or likely	95 (92.2)	20 (94.6)
How likely do you think it is that you will avoid or decrease the chance of getting heart disease if you quit cigarette/water pipe smoking?		
Very likely or likely	94 (91.2)	18 (85.8)
How likely do you think it is that you will avoid or decrease the chance of getting lung cancer if you quit cigarette/ water pipe smoking?		
Very likely or likely	72 (69.9)	18 (85.7)
<b>Health Hazards of Smoking</b>		
Smoking causes stroke	50 (48.1)	12 (57.2)
Smoking causes cardiovascular effects	98 (94.2)	19 (90.5)
Smoking causes respiratory system diseases	103 (99.0)	21 (100)
Smoking causes lung cancer	87 (83.7)	18 (85.7)
Smoking causes other bodily effects.	40 (38.5)	8 (38.1)

\* Some participants smoked both cigarettes and water pipes and so total equals &gt;112.

**Table 3**

Subjects' Willingness to Make a Serious Quit Attempt and Their Confidence in Quitting Smoking After Hospital Discharge

	<b>Cigarette Smokers N=103 Mean (SD)</b>	<b>Water Pipe Smokers N=21 Mean (SD)</b>
Serious willingness to quit smoking in the next month	6.1 (3.49)	4.8 (3.78)
Confidence in quitting smoking after hospital discharge	6.2 (3.59)	4.6 (3.65)
		<b>n (%) the median</b>
Serious willingness to quit cigarette smoking in the next month		51 (49.5)
Serious willingness to quit water pipe smoking in the next month		9 (45.0)
Confidence in quitting cigarette smoking after hospital discharge		60 (58.3)
Confidence in quitting water pipe smoking after hospital discharge		8 (38.1)



**Table 4**

Reasons for Quitting Cigarette and/or Water Pipe Smoking

	<b>Cigarette smokers (n=84) n (%)</b>	<b>Water pipe smokers (n=15) n (%)</b>
Better for health in general	80 (95.2)	15 (100.0)
Less risk of getting smoking related illness	68 (81.0)	15 (100)
Present health problems	82 (97.6)	14 (93.3)
Financial reasons	19 (22.6)	3 (20.0)
Family pressure	55 (65.5)	8 (53.3)
Harms children and others	39 (46.4)	8 (53.3)
Ban on smoking in public places	24 (28.6)	3 (20.0)
Doctor's advice	79 (94.0)	14 (93.3)

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 5**

Methods Used in the Past, and in the Future to Quit Smoking

Method	Methods to quit cigarette smoking		Methods to quit water pipe smoking	
	Used in past	To be used in future	Used in past	To be used in future
	n (%)	n (%)	n (%)	n (%)
My own way without help from others	34 (82.9)	80 (95.2)	3 (75.0)	15 (100.0)
Nicotine replacement therapy	6 (14.6)	7 (8.5)	0	1 (6.7)
Other prescription medications	1 (2.4)	4 (4.9)	0	0
Counseling, educational materials, or smoking cessation programs	13 (31.7)	39 (47.0)	0	9 (60.0)
Physical exercise	7 (17.1)	19 (22.9)	1 (25.0)	4 (26.7)
Decreasing number of cigarettes/water pipe smoking	24 (58.5)	52 (61.9)	2 (50.0)	6 (40.0)
Snacks	9 (22.5)	37 (44.6)	1 (25.0)	8 (53.3)

**Table 6**

Multiple Logistic Regression Analysis to Predict High Confidence in Quitting Cigarette Smoking\*

Significant Variables from Previous Models**	OR	95% CI	p value
Monthly family income (high income)	7.70	2.66, 22.27	< 0.05 <sup>†</sup>
Unit (CCU, ICU, and post cardiac catheterization recovery)	3.92	1.21, 12.70	0.02 <sup>†</sup>
Patient's length of stay in hospital at time of interview (day)	2.63	1.33, 5.26	0.01 <sup>†</sup>
Diagnosis on admission (MI, stable angina, or unstable angina)	2.98	1.07, 8.32	0.04 <sup>†</sup>
Age started smoking cigarettes (year)	1.02	0.87, 1.24	0.77

\* Outcome variable was coded as 0: low confidence (< 7); 1: high confidence (≥ 7)

\*\* Comparisons: monthly family income (low income); unit (medical/surgical ward); diagnosis on admission (others diagnosis).

<sup>†</sup> P value is significant (< 0.05).