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Factors affecting smoking initiation and cessation among Saudi women attending smoking cessation clinics

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An abstract of
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2018

Abstract

Factors affecting smoking initiation and cessation among Saudi women attending smoking cessation clinics

By Yumn Al-Nimr

Background: A description of factors that affect smoking initiation and cessation among Saudi Arabian women is unavailable. This study examines self-reported reasons for smoking initiation and willingness to quit smoking among Saudi women.

Methods: We performed a secondary data analysis on a sample of 2,190 female smokers attending smoking cessation clinics around the Kingdom of Saudi Arabia.

Results: Friends were the most commonly reported reason for initiating smoking, cited as a strong influence by 31.1% of all participants (*CI*: 29.2%–33.1%). Family members constituted the second most important reason for initiating smoking (8.3%, *CI*: 7.1%–9.5%). Combining all social influence-based reasons (friends, family, and social imitation), 42.3% of the sample (*CI*: 40.2%–44.4%) was socially influenced to begin smoking. Regarding factors related to unwillingness to quit, mood change was the most daunting factor to Saudi female smokers considering the cessation of smoking. Health was the most frequently stated reason Saudi women wanted to quit smoking (45.48%, *CI*: 43.38%–47.59%).

Conclusion: Our results highlight the importance of social influence in driving smoking initiation among Saudi women. Future research efforts should utilize longitudinal methods to assess predictors of smoking cessation and the success of quit attempts.

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Chapter 1 - Introduction

Worldwide, almost 1 billion people smoke tobacco daily. The global prevalence of daily smoking is 25% (95% Confidence Interval (CI) 24.2-25.7) among men and 5.4% (95% CI 5.1-5.7) among women. [1] Smoking is the leading cause of preventable death in the world, accounting for 11.5% of global deaths (6.4 million [95% CI 5.7-7.0 million]). [1] Forty-three chemicals in cigarettes are known to be carcinogenic compounds. Smoking harms almost every organ of the body. Globally, smoking related-diseases kill 1 in 100 adults. On average, smokers die 13 to 14 years earlier than non-smokers. [2]

Smoking is a chronic addiction, with nicotine being the addictive ingredient in cigarettes. [3] [4] Smoking-related diseases include cancer, heart disease, and lung diseases such as emphysema, bronchitis, and chronic airway obstruction. Smoking has also been linked to cancers such as bladder cancer, pancreatic cancer, and esophageal carcinoma. [5]

The health effects of smoking are similar in men and women; however, there are some key gender differences. Smoking increases the risk of developing certain types of cancers such as vulva cancer, ovarian cancer and colorectal cancer for women. [6] Nicotine withdrawal symptoms including the urge to smoke, feelings of irritability, and emotional distress are recorded more among women than men. [7]. It was also found that female smokers are more likely to face pregnancy and postpartum complications than non-smokers. Many studies have linked maternal smoking with low birth weight babies [8], as well as early menopause among female smokers. [9]

There are many factors affecting people's choice to begin smoking. Globally, especially in developed countries, aggressive marketing employed by tobacco companies has primarily

driven smoking. [10] Marketing strategies employed by tobacco companies have centered on the idea of emancipation and liberty. Images such as vitality, elegance, sophistication, and modernity are primarily used in marketing campaigns and materials, which play to the self-esteem of customers. [11] There is also evidence to suggest that having a parent that smokes increases risk of becoming a smoker. [12]

Samet & Yoon note that most women start smoking in adolescence, when they are shaping their personality, and are most vulnerable. [13] Another factor associated with smoking among women is the lack of health awareness. Many women smokers have incorrect or incomplete information about smoking; while their perception of benefits derived from smoking tend to be stronger than men. [14]

Once someone becomes a daily smoker, it is difficult to stop. Nicotine withdrawal symptoms including the urge to smoke and feelings of irritability and emotional distress make quitting smoking difficult. People who have friends that smoke or live with smokers tend to have more of a challenge to quit smoking. [15]

Successful quitters are more likely to be men than women. [16] One of the reasons for this could be that nicotine withdrawal symptoms are more often observed among women than men. This aggravation might be due to premenstrual symptoms, which reduce the success of smoking cessation. [7]

In Saudi Arabia, 13.3% of people use tobacco daily. Among males, 22.0% use tobacco; the corresponding figure among females is 1.4%. [17] Women constitute about 5 percent of the adult population that smokes either cigarettes or hookah. [18] Factors that facilitate smoking initiation in Saudi Arabia include that cigarettes are cheap to buy, and there is not much

enforcement of a minimum age for purchase. In terms of factors that affect quitting, religious beliefs and health concerns were reported by the majority. [19, 20]

Primary and secondary smoking prevention programs are conducted in Saudi Arabia. Before the establishment of the National Tobacco Control Program (NTCP) in 2002, prevention programs were conducted in schools and through the media. According to a literature review of 34 studies on smoking in Saudi Arabia published in 2008, most participants indicated they had received at least one encouraging message to quit smoking within the month prior to interview, and had received at least one smoking education class in school. In addition, the country had thirty-three anti-smoking clinics. [21]

The NTCP was established in 2002 under the auspices of the Ministry of Health. The program currently has 70 smoking cessation clinics and 10 mobile clinics across the country, each having a capacity of 20 patients per day. The clinics were established between 2002 and 2010. They provide evidence-based advice to quit smoking along with tobacco substitutes. [18, 22]

Problem Statement

While most of the previous research gives us a sense of the dangerous consequences of smoking in both sexes, with emphasis on the high prevalence of smoking among males, evidence on the reasons for smoking initiation is sparse, specifically among women. In conservative cultures such as Saudi Arabia, where smoking among women is not socially acceptable, it is difficult to gauge the magnitude of the problem and gather evidence on female smokers. Existing research on smoking initiation and cessation among Saudi women is lacking. There is a need for studies that answer questions such as: what motivates Saudi women to smoke, and which women

may find it difficult to quit smoking and why? Without such studies, it will be difficult design and implement effective anti-smoking interventions to curb the rise in smoking among Saudi women.

Research Question

The goal of this study was to provide evidence to fill the research gaps described above. In order to accomplish this, we conducted a secondary data analysis using data from the NTCP affiliated with the Ministry of Health in Saudi Arabia among women who presented to any smoking cessation clinic in the country from January 2014 through January 2017. The objective of the research was to perform a descriptive analysis of self-reported factors related to smoking initiation and cessation.

Significance

The Kingdom of Saudi Arabia has a dearth of research on smoking in general, and among women in particular. This study provides valuable data for the NTCP as it identifies factors that increase the risk of initiation and affect smoking cessation among Saudi women. Evidence from this study would help clinics and the NTCP understand which factors to target in their primary and secondary prevention efforts. This would result in improved targeted interventions that have a higher likelihood of helping a woman quit smoking and prevent them from initiating this behavior, with the overall benefit of improving the health of Saudi Arabian women.

Chapter 2 –A Review of the Literature

Global Perspective

Burden of smoking

Despite recent decreases in smoking rates, one in four men and one in twenty women smoke globally. In terms of prevalence, this represents 25.0% (95% Uncertainty Interval (UI) 24.2-25.7) of men and 5.4% (95% UI 5.1-5.7) of women. A total of 933 million people are estimated to be current daily smokers. In 2015, tobacco caused one in ten deaths, or 11.5% (95% UI 5.7-7.0), killing more than 6.4 million (95% UI 5.7-7.0) people globally. These deaths were a result of smoking-related conditions such as cancer, heart disease, and lung diseases. [23, 24]

As of 2015, the five countries in which smoking was most prevalent are Indonesia, Jordan, Kiribati, Sierra Leone, and the Russian Federation. The five countries in which it is least prevalent are Ethiopia, Panama, Barbados, Ghana, and Ecuador. In some of these countries the low rates may reflect a reduced availability of cigarettes, rather than a conscious individual choice against smoking. [14]

In the United States (U.S.), while the number of smokers has been steadily declining in recent decades it remains the case that about 15% of people aged 18 or older smoke cigarettes. Smoking accounts for nearly 500,000 deaths per year in the country, or 1 out of 5 deaths on average. In 2015, there were more than 16 million Americans who lived with a smoking-related disease. [25] Men in the U.S. are slightly more likely to smoke than women—16.7% versus 13.6%. By race and ethnicity, Native Americans have the highest rate of smoking, followed by African Americans and Hispanics. Asians have the lowest rate of smoking in the U.S., although

this is not indicative of rates of smoking in Asian countries. Smoking is more prevalent in certain groups than others. In particular, smoking tends to be more prevalent among those with low education; young adults (ages 18 to 22); those who live in the South and the Midwest; lesbians, gays, and bisexuals; those who live in poverty; and the disabled. [25] Children with parents who smoke are more likely themselves to take up smoking, even if it is much later in life. [26]

Socioeconomic differences also exist in smoking. It is more common to find women smokers among the low-income class rather than high-income class. Even more so, it is more likely for women of lower socioeconomic status to continue to smoke during pregnancy due to misconception that cigarettes reduce the duration of labor and relieve pain. [27]

Many counties have taken measures to reduce the magnitude of smoking within their borders. These include, most prominently, taxing cigarettes heavily and requiring warning labels on packages of cigarettes. Health warnings on packages are required nearly everywhere that cigarettes are legally sold. However, some warnings are starker than others. In the U.S., for example, the requirement is merely that the packages indicate that quitting smoking greatly reduces one's chances of early death or preventable disease. Warnings often indicate the enhanced risk of smoking for women who are pregnant. [28, 29]

By contrast, in countries such as Singapore, it is mandated that each cigarette package include a photograph of a body part or organ that has been seriously damaged by smoking. Probably, this obvious picture would have greater impact rather than just a regular warning in writing. A recent study that took place in four developed nations concluded that warning labels are somewhat effective in dissuading people from smoking; the reason being that people in general are not fully informed about the risks of smoking. This study concluded that "warnings

that are graphic, larger, and more comprehensive in content are more effective in communicating the health risks of smoking." [30]

Overview of tobacco products

In addition to cigarettes, tobacco and nicotine are also consumed through hookah water pipes, pipes, cigars, and more recently electronic cigarettes. Cigars are typically composed of air-cured or dried tobacco. While they are not, or at least should not be, inhaled, this should not be taken to imply that they are a safe way to consume tobacco. Hookah is a way of smoking tobacco that involves filtration through water. There are also the traditional pipes that are used to smoke tobacco. They consist of a chamber or bowl in which tobacco is packed. E-cigarettes are not a type of tobacco but a kind of nicotine delivery device. The World Health Organization has emphasized that there are no studies showing that e-cigarettes are safe. [31] Finally, there are menthol cigarettes and clove cigarettes that are laced with clove leaves. There is some evidence that these last two varieties may be even more harmful to the body than ordinary cigarettes since they are associated with higher nicotine dependence. [32] And their aromatic unique odor and flavored taste make them very popular for young generations. [33]

In terms of popularity among smokers, conventional cigarettes remain the most common way of consuming tobacco or nicotine, and e-cigarettes have now become the second-most popular method of consumption. Following these in popularity are vapor cigarettes, followed by hookah and other water-based methods of smoking. The popularity of hookah consumption could be related to the custom of consumption during group gatherings, and due to the misconception that hookah (flavored tobacco) is less harmful than cigarettes. [34]

Health outcomes

Smoking is a chronic addiction condition, with nicotine being the addictive ingredient [2] [3]. Cigarette smoke contains over 4,000 different chemicals. Of these, 43 are known to be cancer causing, or carcinogenic, compounds. These include, apart from nicotine itself, tar, carbon monoxide, dichlorodiphenyltrichloroethane (DDT), ammonia, hydrogen cyanide, and even arsenic. Cigarettes are addictive for the same basic reason that "hard" drugs such as cocaine and heroin are addictive—they stimulate the pleasure center of the brain by releasing dopamine into the bloodstream. [35, 36] Some have gone so far as to claim that cigarettes are even more addictive than drugs such as cocaine and heroin. [37]

Smoking harms almost every organ of the body. Globally, smoking related-diseases kill 1 in 100 adults. On average, smokers die 13 to 14 years earlier than non-smokers [4]. For every person who dies from a smoking-related disease, 20 more people suffer with at least one serious illness from smoking. Smoking-related diseases include cancer, heart disease, and lung diseases such as emphysema, bronchitis, and chronic airway obstruction. Smoking has also been linked to cancers such as bladder cancer, pancreatic cancer, and esophageal carcinoma [5]. However, some of the effects reverse after quitting smoking. For instance, the risk of coronary heart disease significantly decreases, and male sexual function significantly increases as a result of quitting. [38]

Smoking among women has similar health effects to those among men. These include emphysema, chronic bronchitis, infertility and cardiovascular diseases as well as cancer. [6] Smoking increases the risk of developing certain types of cancers such as vulva cancer, ovarian cancer and colorectal cancer for women. [7] Nicotine withdrawal symptoms including the urge to smoke, feelings of irritability, and emotional distress are recorded more among women than men.

[7]

Also, it was found that female smokers are more likely to face pregnancy and postpartum complications than non-smokers. Many studies show the harmful association between smoking and low birth weight babies. [8] There is also an increased risk associated with passive smoking and neural tube defects. [39] Smoking does not only negatively affect women regarding the bearing of children. Many studies have shown an association between smoking and risk of early menopause among female smokers. Menopause affects the whole female system, starting from the reproductive system, affecting her ability to give birth, to the mental system, where it is associated with dementia, and many other diseases including osteoporosis. [9]

Smoking initiation

Globally, especially in developed countries, aggressive marketing employed by players in the tobacco industry through sponsorship of public charitable events, for example, has primarily driven smoking, especially young people and women. [10] Marketing strategies employed by tobacco companies have centered on the idea of emancipation and liberty. Images such as vitality, elegance, sophistication, and modernity are primarily used in marketing campaigns and materials, which play to the self-esteem of customers, especially women during adolescence, when they think smoking cigarettes makes them more attractive. [11]

While it is illegal in countries such as the U.S. to target children and young people with smoking advertisements—this is the reason that Camel's famous mascot 'Joe Camel' is no longer featured in advertisements or on packaging—tobacco companies find ways around this. [40] Different types of cigarettes are marketed to different segments of consumers. Cigarettes targeting men tend to have a more robust flavor. An extreme version of this type is the unfiltered

cigarette. In 2010, Samet & Yoon observed some companies are producing cigarettes that are solely targeted towards women. [41] “Light” cigarettes are more targeted toward women. In recent years most countries have required that packaging for light cigarettes make it clear that they are not less dangerous to consume than “full-flavored” cigarettes. Similar points apply to so-called “ultra-light” cigarettes. While these may deliver less nicotine than other forms of cigarettes the evidence suggests that people compensate for this by simply smoking more of them. There are extra wide and extra narrow cigarettes; which tobacco companies target to men, and to women, respectively. [42]

While males are also susceptible to start smoking if they have a friend or family member that smokes, Samet and Yoon noted that this risk factor was stronger for females. These researchers also noted that most women smokers in their study started smoking in adolescence. [13] Although both genders are at higher risk of starting smoking if they have a parent that smokes, one of the key factors introducing women into smoking is having a parent who is a smoker. [12] Another factor associated with smoking among women is the lack of health awareness. Many women smokers have incorrect or incomplete information about smoking, while their perception of benefits derived from smoking tend to be stronger than men. [12]

Smoking cessation

A major issue with smoking cessation is nicotine withdrawal. Symptom of withdrawal include the urge to smoke and feelings of irritability and emotional distress are one of the reasons that quitting smoking is difficult.

People who have friends that smoke or live with smokers tend to find it more difficult to quit smoking. [18] Successful quitters are more likely to have rules against smoking in their homes. [43] Successful quitters are also more likely to be men than women. [16] One of the reasons for this could be that nicotine withdrawal symptoms are more often observed among women than men. This aggravation could in part be due to premenstrual symptoms, which reduce the success of smoking cessation. [7]

If a person has a non-smoking partner, this is likely to affect their decision to quit smoking. [44] Women tend to care about appearance more than men, which could affect their choice to quit smoking. According to a study conducted regarding the emotional impacts of smoking cessation through use of computer software, women became concerned to the point of shock and nausea about the impact of smoking on the their skin and facial features. There is evidence to suggest that an intervention such as this would be effective to convince women to quit smoking. [45]

Demand reduction measures, most prominently, taxing cigarettes and requiring warning labels on packages of cigarettes were found to be effective in smoking cessation. [32]

Regional Perspective – The Middle East

In the Middle East, 13.4% of people use tobacco. The percentage of males that use tobacco is 23.2%, and among females the percentage is 4.5%. [46] The percentage of daily smokers among both men and women in the Middle East/North Africa region was low for 30 years. In 2010, the prevalence of smoking among women began to rise. Cigarette smoking among females in the Middle East is a practice that is rather concealed due to religious and cultural beliefs. [47] Islam demands that its adherents watch their health and not harm

themselves. Despite the fact that this behavior is not socially acceptable, the prevalence of smoking among women continues to increase.

Contrary to cigarette smoking, hookah smoking is more acceptable, and is prominent in Arabic culture. [48] Hookah smoking is misperceived as a safe form of smoking tobacco, contributing to its increased use in the Middle East and North Africa, which is currently 3.5%. [50] [51] Women tend to choose to smoke hookah over cigarettes. Especially in Lebanon, hookah smoking among women is associated with emancipation, and has a sexy allure. [48]

In terms of smoking initiation, it has been found that hookah smokers were more likely to become cigarette smoker compared to non-smokers. [52] Also, evidence in the Middle East indicates that mothers who smoke hookah are more likely to have a daughter who smokes. [51] Initiation into smoking as a result of peer pressure affects only a small portion of female smokers in the Middle East. [53]

National Perspective – Saudi Arabia

In Saudi Arabia, 13.3% of people use tobacco daily. Among males, approximately 22.0%-26.7% use tobacco, while only 1.4%-1.8% of females use tobacco [17] [46] Women constitute about 5 percent of the adult population that smokes either cigarettes or hookah. [18]

Factors that facilitate smoking initiation in Saudi Arabia include that cigarettes are cheap to buy, and there is not much enforcement of a minimum age for purchase. Parent tobacco usage and tobacco use inside the home are other factors associated with smoking initiation. [54] In terms of factors that affect quitting, financial matters were cited only among a small percentage of the population as a reason for quitting smoking. On the other hand, religious beliefs and health concerns were reported by the majority. [19, 20]

Since 2002, the Saudi government has intensified programs aimed at controlling the number of people who smoke. These measures were later taken more seriously in 2005 when the Kingdom joined the World Health Organization's Framework Convention on Tobacco Control. [51] Efforts to deter smoking among women have not been highly successful. Even though most of the countries of the Gulf, including Saudi Arabia have increased prices of tobacco products by up to 200 percent, the number of smokers, including female smokers, continues to rise. [48]

Primary and secondary prevention programs for smoking in Saudi Arabia have been present in schools, the media, and national policy since 1987. However, it wasn't until 2002 that the Ministry of Health established the NTCP. The program provides awareness, scientific, and advisory services regarding the negative effects of smoking, as well as regulation on tobacco products and methods to combat their use. [18] According to a literature review of 34 studies on smoking in Saudi Arabia, most participants admitted they received at least one encouraging message to quit smoking within the month prior to interview, and had received at least one smoking education class in school. [21]

The Ministry of Health expanded the National Tobacco Control Program (NTCP) and the National Smoking Cessation Program (NSCP) was established on February 19, 2007 by the order of the council of the ministers in order to protect the community from tobacco hazards, and maintain a healthy community free of tobacco. [55] According to the Ministry of Health portal, it was founded on May 6, 2002, with a limited role to begin the initial planning efforts and integrate the cessation program into the health system of the 20 regions in the Kingdom.

There are many cities in Saudi Arabia where smoking is completely banned. In 2012, the first city to ban smoking was Almadina, where smokers needed to drive a distance of 70 Km to

buy cigarettes. This ban aims to create a barrier to smoking, particularly for those who have limited access to transportation, such as teenagers. In 2012, the tax on tobacco products was increased under the "Health Tax" initiative to account for treatment of medical consequences of smoking. [20]

There are currently 70 smoking cessation clinics, and 10 mobile clinics, each having a capacity of 20 patients per day. The clinics were established between 2002 and 2010. These clinics provide evidence-based advice to quit using tobacco products including hookah, cigarettes, chew, or sniff. They also provide tobacco substitutes. [18, 21]

More well thought out prevention and control efforts are needed to curb the rise of smoking, particularly among women. In order to devise better interventions, more information about factors affecting initiation and cessation of smoking is needed. This research study aims to identify self-reported factors that affect initiation and cessation of smoking among Saudi women.

Chapter 3-Manscript

Abstract

Background: A description of factors that affect smoking initiation and cessation among Saudi Arabian women is unavailable. This study examines self-reported reasons for smoking initiation and willingness to quit smoking among Saudi women.

Methods: We performed a secondary data analysis on a sample of 2,190 female smokers attending smoking cessation clinics around the Kingdom of Saudi Arabia.

Results: Friends were the most commonly reported reason for initiating smoking, cited as a strong influence by 31.1% of all participants (*CI*: 29.2%–33.1%). Family members constituted the second most important reason for initiating smoking (8.3%, *CI*: 7.1%–9.5%). Combining all social influence-based reasons (friends, family, and social imitation), 42.3% of the sample (*CI*: 40.2%–44.4%) was socially influenced to begin smoking. Regarding factors related to unwillingness to quit, mood change was the most daunting factor to Saudi female smokers considering the cessation of smoking. Health was the most frequently stated reason Saudi women wanted to quit smoking (45.48%, *CI*: 43.38%–47.59%).

Conclusion: Our results highlight the importance of social influence in driving smoking initiation among Saudi women. Future research efforts should utilize longitudinal methods to assess predictors of smoking cessation and the success of quit attempts.

Introduction

Almost 1 billion people smoke tobacco daily. The prevalence of daily smoking is 25% (*CI*: 24.2, 25.7) among men and 5.4% (*CI:* 5.1, 5.7) among women. [1] Smoking is the leading cause of preventable death in the world, accounting for 11.5% of global deaths (6.4 million [*CI:* 5.7-7.0 million]). [1]

Smoking harms almost every organ of the body. Globally, smoking related-diseases kill 1 in 100 adults. Smoking-related diseases include cancer, heart disease, and lung diseases such as emphysema, bronchitis, and chronic airway obstruction. Smoking has also been linked to cancers such as bladder cancer, pancreatic cancer, and esophageal carcinoma. [5]

The health effects of smoking are similar in men and women; however, there are some key gender differences. Nicotine withdrawal symptoms including the urge to smoke, feelings of irritability, and emotional distress are recorded more among women than men. [7] It was also found that female smokers are more likely to face pregnancy and postpartum complications than non-smokers. [8]

There are many factors affecting people's choice to begin smoking. Globally, especially in developed countries, aggressive marketing employed by tobacco companies has primarily driven smoking. [10] Marketing strategies employed by tobacco companies have centered on the idea of emancipation and liberty. There is also evidence to suggest that having a parent that smokes increases risk of becoming a smoker. [12]

Once someone becomes a daily smoker, it is difficult to stop. Nicotine withdrawal symptoms including the urge to smoke and feelings of irritability and emotional distress are one

of the reasons that quitting smoking is difficult. People who have friends that smoke or live with smokers tend to find it more difficult to quit smoking. [15]

Successful quitters are more likely to be men than women. [16] One of the reasons for this could be that nicotine withdrawal symptoms are more often observed among women than men. . This aggravation might be due to premenstrual symptoms, which reduce the success of smoking cessation. [7]

In Saudi Arabia, 13.3% of people use tobacco daily. [14] Among males, 22.0%-26.7% use tobacco; the corresponding figure among females is 1.4%-1.8%. [17] [46] Factors that facilitate smoking initiation in Saudi Arabia include that cigarettes are cheap to buy, and there is not much enforcement of a minimum age for purchase. In terms of factors that affect quitting, financial matters were cited only among a small percentage of the population as a reason for quitting smoking. Religious beliefs and health concerns were reported by the majority. [19, 20]

Primary and secondary prevention programs for smoking in Saudi Arabia have been present in schools, the media, and national policy since 1987. However, it wasn't until 2002 that the Ministry of Health established the NTCP. The program provides awareness, scientific, and advisory services on the negative effects of smoking, as well as regulation on tobacco products and methods to combat their use. [18] The NSCP was established within the Ministry of Health on February 19, 2007 by the order of the council of the ministers in order to protect the community from tobacco hazards, and maintain a healthy community free of tobacco. [55] According to the Ministry of Health portal, it was founded on May 6, 2002, with a limited role to begin the initial planning efforts and integrate the cessation program into the health system of the 20 regions in the Kingdom.

There are currently 70 smoking cessation clinics, and 10 mobile clinics, each having a capacity of 20 patients per day. The clinics were established between 2002 and 2010. These clinics provide evidence-based advice to quit smoking along with tobacco substitutes. [19, 21]

There is a dearth of information available regarding the characteristics of female smokers in Saudi Arabia, particularly, any factors that would be helpful to implement a smoking cessation program. In order to fill this gap, we,conducted a secondary data analysis of data from the NTCP of the Ministry of Health in Saudi Arabia among women who presented to any smoking cessation clinic in the country from January 2014 through January 2017. The objective of the research was to perform a descriptive analysis of self-reported factors related to smoking initiation and cessation.

Methods

Study design

We conducted a secondary cross-sectional data analysis using data from smoking cessation clinics under the National Tobacco Control Program (NTCP) in Saudi Arabia during the period of January 2014 through January 2017.

Study population

The NTCP was officially expanded by the Ministry of Health on February 19, 2007 by the order of the council of the ministers in order to protect the community from tobacco hazards, and maintain a healthy community free of tobacco. It was founded on May 6, 2002, and then expanded to cover the total 20 regions in the Kingdom with a total of 80 clinics (fixed and mobile), with a capacity of counseling 20-patients per day. These clinics are open for the public. Any individual can access their services by a walk-in consultation at the mobile clinics or a

scheduled appointment at the fixed clinics (using the national free landline 937 for booking). [55]

The dataset used for this study included 2190 women of the Saudi nationality and aged 18 years and above. Males were excluded from the study. The study used de-identified data and was determined to be exempt from review by the Institutional Review Board of Emory University in Atlanta, GA, United States. Approval to access de-identified data was obtained from the supervisor general of the NTCP in Riyadh, Saudi Arabia.

Data collection

A trained clinic staff member received patients and collected data from participants during their clinic visit via a self-administered questionnaire. The clinic staff member then entered the questionnaire into the patient's medical record, which pools into a national database. The NTCP compiles clinic data and functions as a central repository of data collected from all smoking cessation clinics nationwide which is shared by an intranet system. This is an effort to expedite the sharing of information, ensuring data quality, and facilitating the utilization of collected data in research studies, with the overall goal of promoting the success of anti-smoking programs and interventions.

Study variables

Information gathered on our study population included demographic data (age, marital status, education, number of children, occupation, monthly income), quitting attempt status (first attempt, or had previous attempts), number of attempts, duration of smoking (months), body mass index (BMI), reasons for initiation, reasons for willingness or unwillingness to quit, and reasons for relapse (in case of multiple previous attempts), as well as presence of a smoker in the

family. Weight and height were collected separately and BMI was calculated from the self-reported weight and height.

Participants were asked to identify their reasons for smoking initiation using a 5-point Likert scale in which they indicated the importance of any individual reason, with 1 indicating the lowest agreement and 5 indicating the highest agreement. There were six categories of reasons: (a) friends, (b) social imitation, (c) family members, (d) stress, (e) advertising, and (f) others.

Two kinds of measurement for attempted quitting were collected. One measure, a dichotomous measure, was whether a woman had any history of attempts of quitting. The other measure, a continuous measure, traced the actual number of quitting attempts.

Participants were asked about the reasons they were willing to quit smoking using a 5-point Likert scale in which they indicated the importance of any individual reason, with 1 indicating the lowest agreement and 5 indicating the highest agreement. There were six categories of reasons: (a) health, (b) money savings, (c) religious beliefs, (d) familial pressure, (e) wanting to live, and (f) others.

Participants were asked about the reasons they were unwilling to quit smoking using a 5-point Likert scale in which they indicated the importance of any individual reason, with 1 indicating the lowest agreement and 5 indicating the highest agreement. They were asked this question to help the clinician understand what potential hindrances the patient will have when attempting to quit smoking. There were six classes of reasons: (a) cost, (b) mood (i.e. mood changes they have experienced when attempting to quit), (c) friends (i.e. going out with friends and smoking socially), (d) fear of mood changes, (e) previous failure, and (e) others.

Statistical analysis

All data analysis for the study was carried out in Stata (STATA 14 / SE. College Station, Texas). In order to describe the population of female smokers, we conducted a descriptive analysis for age, number of children, region, education, monthly income, whether there was a smoker at home, BMI, and whether or not they had a previous quit attempt. Mean and standard deviation were used to describe continuous variables, and frequency and percentage were calculated for categorical variables.

In order to describe the reasons for initiation, we analyzed each factor separately. We counted how many participants marked "strongly agree" for each factor and calculated the percentage of the total study population. We then ranked the factors by the percentage of "strongly agree" responses. We then combined the percentages of the three social reasons for initiation: friends, family members, or social imitation. Point estimates and binomial confidence intervals were calculated for each factor.

In order to describe the willingness to quit, we analyzed each factor for willingness to quit separately. We counted how many participants marked "strongly agree" for each factor, and calculated the percentage of the total study population. We then ranked the factors by number of "strongly agree" responses." Point estimates and binomial confidence intervals were calculated for each factor.

In order to describe unwillingness to quit, we separately analyzed each factor for unwillingness to quit. We counted how many participants marked "strongly agree" for each factor, and calculated the percentage of the total study population. We then ranked the factors by number of "strongly agree" responses." Point estimates and binomial confidence intervals were

calculated for each factor.

Results

Sample characteristics

Forty-one percent of women in our sample were 30 years old or younger. A slight majority (*n* = 1,107) of the participants was from either Makkah or Jeddah with percentages of 26.1%, and 24.4%, respectively. The highest percentage (*n* = 459) of the sample possessed a Bachelor's degree or higher than Bachelor's education (n=429), representing a percentage of 30.95% and 28.93%, respectively. Nearly 44% of the sample (*n* = 577) reported no income. Slightly over 67% (*n* = 1,475) lived with a smoker in the home, and only 19.48% of the sample (*n* = 262) was overweight or obese (Table 1).

Reasons for smoking initiation

Friends were the most commonly stated reason for initiating smoking, with friends cited as a strong influence by 31.1% of all participants (95% *CI* = 29.2% - 33.1%). Family members constituted the second strongly agreed reason for initiating smoking, 8.3% (95% *CI* = 7.1% - 9.5%). When the response categories for all three social influence-based reasons, having a friend who smoke, having a family member who smokes, or social imitation, were aggregated, a 42.33% of the sample (95% *CI* = 40.25% - 44.43%) reported being social influenced to begin smoking (Table 2).

Willingness and unwillingness to quit smoking

Health was by far the most important reason Saudi women wanted to quit smoking (45.48%, 95% *CI*: 43.38%- 47.59%). Family (20.37%, 95% *CI*: 18.7%- 22.11%) and religion (18.13%, 95% *CI*: 16.53%- 19.81%) were in second place with overlapping confidence intervals. Saving money was cited among 14.8% of participants (95% *CI:* 13.3 %- 16.3%), and wanting to live was cited among 14.3% (95% *CI:* 12.9%- 15.9%) (Table 3).

Table 4 below contains the point estimates and binomial confidence intervals for reasons that Saudi women are unwilling to quit smoking. Previous experience of mood changes was the most common factor for unwillingness to quit among Saudi female smokers, with the point estimate of 28.0% (95% *CI:* 26.1%- 29.9%). Friends were cited among 28% (*CI:* 16.9%- 20.02%) of participants, and cost was cited among 13.2% (*CI:* 11.9%-14.7%) of participants as a reason they were unwilling to quit smoking.

Discussion

In this analysis of a large sample of Saudi women attending smoking cessation clinics, social influences were reported as the most common reason for smoking initiation, with friends proving to be more influential than family, and family more influential than social imitation. Health was the most commonly stated reason for willingness to quit, with family and religion following. Mood was the most commonly stated reason for unwillingness to quit smoking, with friends and cost following.

One point of note is the conceptual relationship between initiation based on (a) social imitation, (b) friends, and (c) family members. These three reasons all reflect different forms of

the same kind of social influence, which is also known as social cognition in the psychological literature. [56-58]

Health was by far the most important reason Saudi women wanted to quit smoking; religion and family were the second most commonly stated reasons, and saving money and wanting to live were the least commonly stated reasons. In a study of reasons for quitting smoking, women were less motivated than men to quit for health concerns. The cost was stated as the second most frequent predictor of successful smoking cessation in a five-year longitudinal study. [59]

Saudi women appear to have a rational view of smoking, one in which they are aware of the health risks. However, based on the findings for reasons for unwillingness to quit smoking, fears about changes in mood appear to override many Saudi women's health-informed rationale for quitting smoking, which is supportive of the previous studies about the effect of the menstrual cycle on the nicotine withdrawal symptoms. [60] Thus, smoking interventions should focus on mood support for Saudi women who intend to quit, or are in the process of quitting smoking.

The study had several limitations. Certain conceptual categories were worded ambiguously; for example, 'wanting to live' and 'health' are presumably part of the same construct but were treated as separate response categories in the analysis. Some variables, such as age, should have been collected on the continuous scale. Regarding categories of age, there was a category for 10-15 year olds. While having 10 year-old female smokers could have been a data entry error, it is also plausible that there were 10 year-old female smokers. Finally, missing values were not categorized, making it difficult to discern between 'true' missing values and 'inapplicable' answers, for example.

The major strengths of this study are the large sample size, the use of a nationally representative data that covers all regions of the Kingdom of Saudi Arabia, and the use of data collected via a standardized questionnaire and uniform data collection procedures.

In conclusion, the social influence on initiation of smoking observed in this study should inform policy makers to provide social support groups in the community to encourage people not to smoke. This study showed that Saudi women have a rational view of smoking, one in which they are aware of the health risks. However, fear of mood changes appeared to be a highly concerning factor in quitting smoking. Thus, smoking interventions should focus on mental health support for Saudi women who intend to quit, or are in the process of quitting smoking.

Tables

Table 1: Description of women attending smoking cessation clinics in Saudi Arabia, January 2014 to January 2017

Participant Characteristic	Frequency (N= 2,190)*	Percent
Age (years)		
10-15	181	8.3
16-20	110	5.0
21-25	283	12.9
26-30	322	14.7
31-40	432	19.7
41-50	284	13.0
51-60	155	7.1
Over 60	423	19.3
Clinic site		
Al-Baha	1	0.1
Al-Jouf	11	0.5
Al-Madina	69	3.2
Al-Qaseem	1	0.2
Al-Qurrayat	5	0.2
Aseer	2	0.1
Bishah	3	0.1
Eastern Region	44	2.0
Hafer Al-Batin	6	0.3
Jeddah	535	24.4
Jizan	45	2.1
Makkah	572	26.1
Najran	9	0.4
Northern Borders	153	6.9

* The total number of women varied as some of the variables had missing data

Riyadh	37	1.6
NTCP Central	461	21.1
Tabouk	8	0.4
Taif	228	10.4
Education		
Illiterate	58	3.9
Primary School	83	5.6
Middle School	142	9.6
High School	429	28.9
Diploma	120	8.1
Bachelor	459	31.0
Master	18	1.2
Doctorate	6	0.4
Other	168	11.3
Monthly Income (Saudi Riyal)		
No income	577	43.9
Less than 3000	206	15.7
3000-5999	264	20.1
6000-10000	174	13.2
More than 10000	93	7.1
Smoker at home		
No	1,475	67.35
Yes	715	32.65
BMI		
Underweight	350	26.02
Normal Weight	733	54.50
Overweight	262	19.48
Previous Quit Attempt		
No	1,615	73.74

Yes	575	26.26

Table 2. Reasons for smoking initiation among Saudi women attending smoking cessation clinics, January 2014 to January 2017

Smoking initiation reason	Proportion of women who strongly agreed to reason for smoking initiation N (%) N= 2,190	95% confidence interval for proportion	
		Lower Bound	Upper Bound
Friends who smoke	682 (31.1%)	29.2%	33.1%
Family members who smoke	181 (8.26%)	7.2%	9.5%
Stress	125 (5.7%)	4.8%	6.8%
Others	71 (3.2%)	2.5%	4.1%
Social imitation	64 (2.92%)	2.7%	3.7%
Advertising	22 (1.0%)	0.6%	1.5%

Table 3: Reasons for willingness to quit smoking among Saudi women attending smoking cessation clinics, January 2014 to January 2017

Reason for willingness to quit	Proportion of women who strongly agreed to reason for willingness to quit N (%) N= 2,190	95% Confidence Interval	
		Lower Bound	Upper Bound
Health	996 (45.5%)	43.4%	47.6%
Familial pressure	446 (20.4%)	18.7%	22.1%
Religious beliefs	397 (18.1%)	16.5%	19.8%
Money savings	323 (14.8%)	13.3%	16.3%
Wanting to live	314 (14.3%)	12.9%	15.9%
Other	30 (1.4%)	0.9%	2.0%

Table 4: Reasons for unwillingness to quit smoking among Saudi women presenting to smoking cessation clinics, January 2014 to January 2017

Reason for unwillingness to quit	Proportion of women who strongly agreed to reason for unwillingness to quit N (%) N= 2,190	95% Confidence Interval	
		Lower Bound	Upper Bound
Mood	613 (28.0%)	26.1%	29.9%
Friends	405 (18.5%)	16.9%	20.2%
Cost	290 (13.2%)	11.9%	14.7%
Fear	245 (11.2%)	9.9%	12.6%
Previous Failure	170 (7.8%)	6.7%	9.0%
Others	65 (3.2%)	2.3%	3.8%

Chapter 4 – Conclusion and Recommendations

Based on our study, we recommend the following for further research investigations, the NTCP, and policy makers.

Recommendations for future research:

- Conduct longitudinal studies that assess predictors of smoking cessation and successful quit attempts among women in the Kingdom of Saudi Arabia.
- Establish ongoing monitoring programs for trends in smoking prevalence among women.

Recommendation for the NTCP:

- Establish mobile smoking cessation clinics in the remote rural areas to deliver service for hard-to-reach populations.
- Follow up participants over time to monitor quit attempts and their success.
- Improve the quality of data collected in smoking cessation clinics.
    - When undertaking this study, many missing values were encountered. An effort to ensure data completeness is needed.
    - Improve the phrasing of some of the questions and parameters. Certain conceptual categories were worded ambiguously; for example, ‘wanting to live’ and ‘health’ are presumably part of the same construct but are listed as separate categories.
    - Establish workshops to train data collectors in the smoking clinics to have standard data entry and data collection processes all around the nation.

Recommendation for the policy makers:

This analysis provides useful data to public health policy-makers in Saudi Arabia. The results provide insights into the factors that prompt women to initiate smoking and try to quit as well as the factors that render women unwilling to quit. These factors can reveal how to properly structure a smoking cessation intervention among Saudi Arabian women. Examples of factors to consider in interventions include:

- Provide social support groups for the young generation to encourage them to quit smoking.
- Encourage alternative ways to smoking to control mood swings, especially in the premenstrual period.
- Develop targeted advertisement for quitting smoking among females and use effective images to display the effect of smoking on skin, aging and appearance.
- Utilize the geographic findings to intensify efforts and concentrate additional resources in regions in which women are less likely to try to quit smoking.
- Provide free stress management programs for women as part of the NTCP.
- Establish programs that engage women in healthy activities and forms of entertainment during their free time, which would deter them from initiating smoking.

Overall, the National Tobacco Control program should use mobile clinics in remote areas and follow up with participants to monitor quit status. We recommend that policy makers use the data presented in our study to properly structure a smoking cessation intervention for Saudi Arabian women, i.e. providing a social group for the young generation, finding a way of smoking cessation which prevents the mood swing, and advertise the negative effects of smoking on appearance

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