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An Analysis of Visits to Fixed and Mobile Smoking Cessation Clinics, Kingdom of Saudi Arabia, 2014 – 2015

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Global Health

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Abstract

Analysis of Fixed and Mobile Smoking Cessation Clinics, Kingdom of Saudi Arabia, 2014 – 2015

By Naif Mohammed Alraihan

Background: Smoking rates in the Kingdom of Saudi Arabia (KSA) have increased over the past decade. This has led the Ministry of Health (MoH) to establish a Tobacco Control Program to eradicate tobacco use. According to a national survey in 2010, 37% of males and 6% of females were smokers; rates that have more than doubled compared to those 10 years earlier. The Tobacco Control Program has instituted a new approach of using mobile smoking cessation clinics (MSCC) to help those who want to quit. We compared the efficacy of the MSCC and fixed clinics by measuring number of visitors and attempts at quitting.

Methods: Participants attending the Tobacco Control Program smoking cessation clinics in 19 health regions of KSA between July 2014 to July 2015 were surveyed. Ten regions had both mobile and fixed clinics and nine had only fixed clinics. We examined the overall number of participants, the number visiting each clinic type; by gender, region, age group, and smoking status (first-time quitters and those who had previously attempted).

Results: From July 2014 – July 2015, 30,210 KSA participants attended smoking cessation clinics. Over half (16,376; 54%) attended fixed clinics and 46% (13,834) attended mobile ones; 94% (28,330) were male and 6% (1,880) were female. Fixed clinics were chosen by 56% (15,912) of the men, and by 25% (464) of women. In contrast, mobile clinics were chosen by 75% (1,416) of women and 44% (12,418) of men.

Conclusion: MSCC were more accessible and appealing to certain demographic elements of the KSA population than fixed ones. However both foster an environment of safety, comfort, and confidentiality.

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Chapter 1- Introduction

Background

One of the most threatening and urgent global health concerns is tobacco smoking; its global health significance is breath taking. Tobacco smoking causes elevated morbidity and mortality all over the world. Golechha (2016) reports that more than 5 million people around the world are die each year because of tobacco; the number of deaths is expected to double by 2020. The effects of tobacco extend to family, society, and the environment; it is not only detrimental to personal health.

In third world countries, smoking prevalence is particularly high, and a significant portion of smokers begins during adolescence. Abdallah, Kaabba, Saeed, Abdulrahman, and Raat (2007) studied the alarming smoking statistics of Kingdom of Saudi Arabia (KSA) youth and reported that smoking had increased rapidly; 66% of secondary school students started smoking as early as 12 years of age and 34% of young men and 11% of young women smoked.

Based on a national survey conducted in KSA between 1990 and 1993, the prevalence of smoking among males was 21.1% and 0.9% among females. But by 2010 this prevalence had almost doubled among males to 37% and risen to 6% among females. In the KSA, smokers use cigarettes and hookah. Cigarettes are more common among males and hookah is more common among females. The impact of tobacco extends further than morbidity and mortality to significant social and the economic costs (Almutairi, K. 2015)

The Ministry of Health (MoH) started a national tobacco control program in 2002 in cooperation with the World Health Organization (WHO). This program began by passing a ban on smoking in public places, including healthcare facilities, restaurants, cafes, airport and government facilities. It also mandated that warnings be added to tobacco packages. Free treatment was introduced for smokers attempting to quit, such as nicotine replacement therapy, bupropion, and varenicline.

Study Problem

A number of countries spend exorbitant amounts on tobacco purchases and tobacco-related health problems. For example, the 2015 CDC fact sheet reported that the United States spends close to $170 billion per year on tobacco-related healthcare costs (CDC, 2016). According to the Arab News (2016), smokers in KSA spend more than SR 33 billion and consume 99 tons of tobacco annually. Also, the prevalence age of smokers among the KSA population is 45% for male and 3% for female. Furthermore, KSA's population consumed 13 billion cigarettes in 2008. KSA is a Muslim country, and despite Islam's prohibition of the use of any substance that can be detrimental to one's health and the obvious negative consequences of smoking tobacco, Saudi Arabians continue smoking.

Youth and females appear to be the demographic groups most difficult to reach with smoking cessation efforts. This observation raises the question: Why does such an elevated prevalence of tobacco smoking plague KSA? More importantly, what can be done to stop it?

Study Purpose

To improve and enhance smoking cessation efforts, newly proposed interventions must reach youth and women in KSA. Methods to ameliorate the KSA smoking crisis have been mildly effective at best. Certain efforts promise enhanced smoking cessation results when combined with an in-depth analysis of the underlying reasons of high smoking prevalence in KSA.

To examine KSA smoking prevalence, we examined the risk factors as the environment and belief systems of smokers. Recent smoking cessation programs in KSA have been characterized by a combination of fixed smoking cessation clinics and mobile cessation clinics. Almutairi (2014 b) comments on the paradox of KSA smoking prevalence and cultural aspects when he states that according to Shari'ah rules, smoking is unacceptable behavior among both genders, and this is one of the reasons that smoking is not socially acceptable in KSA. However, the high consumption of tobacco in KSA has resulted in its being ranked 23rd globally. Obtaining testimony, survey responses, and information on relevant lifestyle choices is challenging due to the firmly upheld KSA cultural and religious doctrines of modesty and discretion.

Dr. Ali-Alwaide (2015) made comments relevant to gender disparity in the KSA in *The Arab News* on the development of mobile cessation clinics with separate sections for females when he remarked, since the Tobacco Control Program has been inserting the mobile clinics, the number of female smokers visiting the mobile clinics reached 9,710 which represents 88.3% of visitors to mobile clinics; and of which 11.7% are males. Addressing the above mentioned gaps and limitations of previous studies will assist in the

creation of a more highly effective smoking cessation plan and enable a focus on sectors of the population that are ignored.

The objectives of this study are to calculate the overall number of visitors to all smoking cessation clinics, the numbers of visitors to each clinic type (fixed and mobile), the number of visitors by gender, by region, by age group, and smoking status (first-time quitters and those who had attempted previously) from July 2014 – July 2015. With this information, we can determine the clinic type that is more acceptible to the general population and particular demographic segments like age and gender.

No study of this kind has been conducted in KSA. Most present the prevalence of smoking, but don't monitor cessation. This study is based on data from the KSA Tobacco Control Program and gathering from different regions; the findings provide information about number of visitors to smoke cessation clinics.

Chapter 2- Literature Review

Global Issues

Al-Lehiany and Stanley (2009) express the gravity of tobacco use and smoking problems in KSA and other underdeveloped countries by first comparing their predicament to developed ones. Although developed countries have made great strides smoking cessation and relaying the health hazards of smoking to their inhabitants over the past few decades, smoking is currently on the rise in developing countries. Sadly, the health consequences of smoking can be easily prevented, but the messages do not reach the majority of KSA people. In fact, this deadly habit is becoming increasingly normalized among KSA youth. Abdallah, Kaabba, Saeed, Abdulrahman, and Raat (2007) state the alarming smoking statistics of KSA youth when they reported that in addition to a rate of 34% for males and 11% for female secondary school students, 66% typically began smoking as young as 12 years old.

Furthermore, the rapid progression of KSA smoking prevalence is marked by a 40-fold growth in tobacco-related imports from 1061 tons in 1961 to 41,440 in 1987 (Al-Lehiany & Stanley, 2009, p. 3-4). The main factor affecting smoking habits is the influence of friends. However, there appears to be a gender difference in attitudes towards smoking that is based on factors such as prevalence, access to tobacco, knowledge and attitude, environmental tobacco smoke, cessation of smoking, tobacco-related advertisements and education on tobacco (Al-Lehiany & Stanley, 2009, p. 4). Smoking cessation programs strive to target religion, reduction in nicotine amounts per cigarette, and sterner health warnings on cigarette packages.

Almutairi (2014a) contends that the global health problem of addiction to tobacco smoking is a preventable issue. It is clear that this habit is hazardous to one's health; furthermore, other parties can be harmed by second-hand smoke. This objective of this study is to compare the prevalence of tobacco smoking in KSA, instructors, and administrative staff to gauge interest in smoking cessation. Additionally, this study aims to understanding variations in viewpoints of smoking and non-smoking students, faculty, and staff on smoke-free policies (Almutairi, 2014, p. 894). This study interviewed students in the largest university in Riyadh, KSA throughout 2013. The Likert scale and the Chi squared determined the discrepancy of a smoke free campus for smokers and non-smokers. Almutairi (2014) reported elevated staff member smoking rates (36.8%) as well as student and faculty rates of 11.2% and 6.4%. For that matter, a little over half of university smokers (53.7%) made attempts at cessation.

Results indicated OR and 95% CI rates of 3.10 and 1.00-9.60 for students and 4.06 and 1.16-14.18 for the faculty.Students and faculty appeared to have a greater inclination towards quitting than staff members (p. 894). These statistics show that most participants support a smoke-free policy and also support smoking being contained in specific venues. Additionally, results indicated that smokers support a smoke-free policy devoid of fines or penalties.

Bolliger et al. (2011) report that the pervasiveness of tobacco smoking is on the rise developing countries. Past assessments of the value and acceptability of varenicline, a medication that assists in quitting smoking, have been biased in the sense that their subjects are mainly Caucasian. This purpose of this multinational, randomized, double-blind, placebo-controlled trial of forty-two clinics in eleven countries was to evaluate

these same variables in participants from Latin American, African and Middle Eastern regions regarding possible variations in the therapeutic reaction to this drug therapy. A mixture of smoking cessation candidates consisted of male and female subjects ranging from eighteen to seventy-five years of age. The trial lasted for twelve weeks and included a follow up period of twelve weeks in addition to counseling. Results indicated statistical likenesses of simultaneous use of medication between the two groups being treated. Roughly 67.4% of the vareniclines group and 65.7% of the control group commonly used some sort of parallel drug therapy, and analgesics were the most common form (varenicline group-24.1%, placebo group-22.2 (Bolliger et al., 2011, p. 471). Conclusions supported the original hypothesis in revealing that varenicline was successful in assisting with smoking cessation; however, it was linked to a larger amount of AEs as opposed to the placebo group. These adult smokers had origins in 11 different Middle Eastern, Latin American and African countries (Bolliger et al., 2011, p. 476).

Vijayaraghavan, Messer, White & Pierce (2013) conducted a comparison study that provides an example of the global universality of smoking cessation tactics. They state as their objective that homes that are devoid of smokers are sounder indicators than cost in quelling smoking habits based on the contention that smokers may invent price-reduction methods; however, they display difficulties in curtailing the effects of smoking limitations (p. 2277). This cross-sectional study employed the 2006-2007 Tobacco Use Supplement to the Current Population Survey (TUS-CPS) to investigate the connection of smoke-free policies in homes and communities with smoking habits according to poverty status. The authors incorporate social cognitive theory and its relevance to human

motivation to alter positive or negative behaviors and habits in relation to adjustments in their surrounding environment.

On this note, the authors contend that some smokers may thwart the expenses incurred from price increases by switching to less expensive tobacco products. Conversely, smokers who intend to quit may see the elevated price as an additional incentive for permanent smoking cessation. The main concern is that the higher propensity towards excessive smoking from lower economic sectors possibly denotes a weaker sense of personal autonomy. Therefore, they would continue to smoke at the same rates regardless of price (Vijayaraghavan, Messer, White & Pierce, 2013, p. 2276).

Economic theory, however, suggests that increases in cigarette prices should significantly impact the smoking habits of lower income sectors of the population. The authors conclude that in spite of the fact that income is a determining factor in non-smoking households, fewer variations existed across income levels than those across homes with smoke-free conditions. Overall, the results indicate the possibility of the smoke-free home status playing an instrumental role in promoting cessation and discouraging the relapse of low-income smokers (Vijayaraghavan, Messer, White & Pierce, 2013, p. 2279). Although price somewhat affects smoking habits, environment has a much more significant impact on smoking habits and smoking cessation.

The World Health Organization (WHO) (2010) dissects the subject of gender analysis in relation to smoking hindrance strategies. This approach is based on the Health Belief Model, which contends that the main determining factor in smoking habits stems from individual values, perceived situations and opinions. Furthermore, the introduction of a gender-based element into tobacco control efforts must include an assessment of how

the impact of biological, social, economic and cultural elements on health hazards and outcomes are based on differing needs of males and females (WHO, 2010, p. 16). They suggest a holistic methodology to uncover the necessary underlying evidence that will serve as the catalyst for triumphant smoking cessation programs that are based on gender-specific perspectives.

For example, in the case of impoverished, downtrodden women who smoke in spite of their knowledge to tobacco health hazards a method that factors in the gender aspect must consider the reality of underprivileged females who require a sense of economic empowerment to make significant behavior adjustments (WHO, 2010, p. 17). In summary doctors ideally should incorporate an extensive knowledge gender-specific risks when treating females with tobacco-induced afflictions and disabilities. Moreover, structural modification programs have an adverse effect on providers and patients because their payment stipulations discourage the desired influx of participants (WHO, 2010, p. 18). This tactic is relevant to the propensity of Saudi Arabian females to participate in mobile smoking cessation programs more frequently than with other clinical options due to the fact that they are specifically tailored to female needs.

Smoking Prevalence in KSA

Almutairi (2014b) create a review that aims to determine the prevalence of smoking among KSA students and to study and to identify, integrate and recap the precursors that predict smoking among students of various age groups. Searched databases included Web of Science, Google Scholar, Pub Med and Science Direct during October of 2013. Analyzed studies for methodological accuracy were based on Russell and Gregory's criteria. Out of the twelve articles reviewed, the findings showed that the

prevalence of smoking is still just as high in KSA. The age of smoking was started among adolescents ranged from ten to fifteen years of age. The university student ages began at sixteen years old. Influence from friends was the main culprit of smoking in addition to peer pressure, stress, media and imitation of others. Al-Nohair (2011) has the objective and aim to approximate the pervasiveness of tobacco smoking amidst secondary school students in National Guard area of Riyadh in his June 2009 cross-sectional study of a random sampling of 255 students. Additionally, his goals are to investigate the motives for the developing a smoking habit as well as the viewpoint of non-smoker towards smoking habits in general. His evaluation method consists of a self-directed survey. In 1999, smoking prevalence in male secondary school students in three KSA regions was estimated at 21.1% compared with the 2004 United States adult smoking prevalence of 20.9%. Al-Nohair (2011) further reveals the normalcy of smoking in Saudi Arabian youths when he reports that although religious beliefs discourage smoking in a number of secondary school students (69.6%), approximately 32.10% of these youths freely and openly smoke in front of their instructors (p. 52).

Regarding personal reasons for and attitudes towards smoking, this study revealed that the imitation, relaxation, leisure time, stress, sentiments of fortitude, the lure of the smoking habit, desire to call attention to oneself and affinity for certain smells (shisha) are the most common ones. Social reasons are listed as copying authority figures or fitting in with peer groups. The majority of the personal reasons were related to leisure time (81.6%) and stress (63.2%). The desire to feel strength and attract outside attention constituted the highest rate of disagreement, respectively 71.1% and 52.6% (Al-Nohair, 2011, p. 55).

However, witnessing teachers smoking proved to be quite impressionable on these young minds. In addition to placing the brunt of the responsibility on adults and authority figures who are seen as role models, Al-Nohair (2011) suggests the establishment of additional mobile cessation clinics to help larger numbers of smokers quit, and he urges researchers to continue studies on the health consequences of smoking. He also posits that school administrative authorities should act as role models for the students by partaking in visits to charity organizations that lobby against smoking, (p. 56)

Amin, Amr & Zaza (2011) employ a multi-stage proportionate sampling technique to determine the prevalence and determinants of the current smoking status among 1,652 secondary school students in Al-Hassa, Saudi Arabia via anonymous and detailed surveys. These included: the Arabic version of the Global Youth Tobacco Survey, a revised version of the Fagerstrom Test for Nicotine Dependence and Patient Health Questionnaire to detect possible anxiety and depressive disorders. According to the results on prevalence for all forms of tobacco was 21.7% for 358 male and female individuals and 30.3% and 8.5% for current male and female tobacco smokers. There was 25.4% prevalence in the 419 (34.6%-males, 11.3%-females) "ever smokers." Furthermore, 43 males and 18 females claimed to be former (Amin, Amr & Zaza, 2011, p. 342). The authors stumble upon an astounding revelation when they note the manner in which these children mimic the behaviors of their adult family members more so than those of their peers when they reveal that youths in Eastern global regions embody a communal identity. For that matter, the societal expectation of children to conform to and follow the imposed socialization tactics of their family members is not separated from the family unit as a whole. In other words the behaviors, viewpoints, aspirations and beliefs

of children and one in the same in relation to the family unit (Amin, Amr & Zaza, 2011, p. 347). Furthermore, rates of depression and anxiety were higher in the group of smokers. Amin, Amr & Zaza (2011) conclude that certain risk factor of Eastern adolescent smoking habits, such as anxieties and collective mobilization, can be more efficiently resolved through programs that focus on cultural specifics (p. 348).

Gaffar, Alsanosy & Mahfouz (2013) objectives included establishing the commonness of and elements linked with tobacco smoking as well as pinpointing the corresponding aspects. Furthermore, this study analyzed the liaison between smoking versus chewing tobacco amongst intermediate and secondary school students in the Jazan Region of KSA. Study method included a cross-sectional study with a sample of 4100 intermediate and secondary school students in Jazan. These data were collected using a pretested modified version of the global youth tobacco survey questionnaire.

Results indicated that understanding the factors and predictors associated with tobacco use will help identify high-risk groups (e.g., students with fair/low academic performance, students with friends who use tobacco, and students who feel stressed in schools) and this understanding will aid in the design of tobacco/substance abuse prevention and control activities in Jazan and areas with similar populations. The prevalence of tobacco in Jazan, Saudi Arabia, and GCC reflects the need for greater enforcement of regulations that prohibit access to tobacco products by the underage population. (Gaffar, Alsanosy & Mahfouz, 2013, p. 387). Authors also posit that the use of khat is progressively spreading outside of its usual regions and into Europe and America, this finding could affect tobacco control efforts globally.

Efforts to Reduce Smoking in KSA

Al-Hosani *et* al. (2015) report that strenuous efforts on the part of the KSA government have been ineffective in hindering the spike in the number of smokers. The objective of this study was to analyze the mindsets, habits and views on risk of primary health care providers in the ambulatory health services in Abu Dhabi on smoking. Secondly, the study attempted to evaluate how smoking status affected their methods of smoking counseling. The authors state as their rationale that this research is legitimate because it offers a comprehension of how healthcare provider and service delivery smoking attitudes can influence the process of patient counseling (Al-Hosani *et* al., 2015, p. 47). Anonymous questionnaires were given to 122 doctors and nurses (47% doctors and 54% nurses). Results revealed that 87.5% of the subjects regularly smoked cigarettes in spite of their support of smoking cessation programs. These professionals may be flawed in their training on methods of counseling patients on quitting smoking. In conclusion, the authors recommend smoking cessation programs, continuing education and training on smoking cessation and the incorporation of smoking cessation activities as an integral part of the PHC system for all staff members.

Al-Mohrej, Al-Traif, Tamim & Fakhoury (2014) use an Arabic questionnaire with data on demographic and socioeconomic components, history of smoking habits and personal outlooks on the impact of price increase on cigarette use from April to May of 2013. Their objective of this cross-sectional study of 2,057 KSA inhabitants (92% males) in the city of Riyadh is to discover whether or not the price of cigarettes has an effect on the prevalence of tobacco consumption in KSA. The participants raged in age from 21-30 years, and they had an income of $800 or more. This is the first KSA study on this

subject matter. The authors report that although public smoking in the KSA was outlawed in 2004, this country still holds the number four global ranking in the import of tobacco products. For that matter, the KSA has suffered a financial loss equivalent to 20.5 billion U.S. dollars over the past 10 years (Al-Mohrej, Al-Traif, Tamim & Fakhoury, 2014, p. 154). This figure clearly indicates that price is not currently a deterring factor in cigarette smoking because the price per pack is the equivalent of 2.67 U.S. dollars. Results stated that the income of KSA resident smokers was significantly higher with 32% of smokers earning less than 800 U.S. dollars per month. Non-smokers represented 64.5% of this sample. KSA smokers with high levels of education equaled to 97.1%, and non-smokers with secondary school completion and some degree of higher education equaled 89% (Al-Mohrej, Al-Traif, Tamim & Fakhoury, 2014, p. 155). According to multivariate assessment of the risk factors, males are more susceptible to developing this habit. The authors conclude that raising the price of the most commonly smoked cigarettes from2.67 US dollars to 8.27 US dollars should incite an influx of smoking cessation attempts in the KSA population. Figures predict that those with incomes lower than 800 U.S. dollars (30%) will benefit the most from this price increase in terms of health (Al-Mohrej, Al-Traif, Tamim & Fakhoury, 2014, p. 157).

Haseelbuh & Almotairi (2012) discuss the painstaking efforts of the Saudi Arabian government to curb the burgeoning smoking habits of its citizens through suggestive and coercive advertisements that emphasize the negative consequences and anti-social repercussions of smoking. Hyland *et* al. (2006) reiterate the intentions of these banner messages when they comment public campaigns and messages against smoking is a fundamental component of the Tobacco Control Programme (TCP), which is tailored

towards negating harmful smoking influences and boosting the proliferation of health promotion messages. The goal here is to lower the probability of individuals beginning smoking habits through influence and aggressive interventions through the backing of the public (as cited in Haseelbuh & Almotairi, 2012, p. 69). The basis of their logic is to utilize the same tactics that tobacco companies employ to lure young, impressionable adults by using the appeal of positive and healthy messages instead. Sadly, this is a matter of urgency. If the smoking trend continues to grow in Saudi Arabia, it will be responsible for 8 million casualties per year by 2030. Wolburg (2004) and Hyland *et* al. (2006) support the efforts of anti-smoking campaigns particularly aimed at younger generations when they assert that there are high hopes for the anticipated, direct correlation between anti-smoking campaigns and reductions in the number of teens who are just beginning to develop smoking habits. The fact that this correlation has been observed in adult smokers supports the predicted results of these campaigns (as cited in Haseebuh & Almotairi, 2012, p. 71). The authors state in their final remarks that the exponential growth in smoking prevalence confirms the necessity of education programs about the health hazards of smoking. In spite of past efforts, this goal has not yet been achieved (Haseelbuh & Almotairi, 2012, p. 74).

Jarallah (1996) raises questions as to whether or not tobacco control will have any significant effect on the Saudi Arabian population when he states the positive results of the efficacy of a number of pharmacological as well as non-pharmacological methods of tobacco regulation. Among these tactics are: taxation, prohibition of smoking on the job, advisement from physicians, complementary therapy sessions, smoking cessation clinics and various forms of nicotine substitution therapy. Regardless, integrated and focused

strategies are key in the improvement of tobacco control in the KSA (Jarallah, 1996, p. 10). In spite of the numerous health initiatives and anti-smoking campaigns, tactics to curb smoking in Saudi Arabia remain weak and barely effective due to their disjointed lack of unity, consistency and organization. The main issue with the thirty-three established smoking cessation clinics set up by The Saudi Smoking Control Charitable Society at this time was the 13% rate of relapse. Jarallah (1996) points out the flaws in these programs by insisting that smoking cessation participants must be determined to change, thoroughly educated on the dangers of smoking and their options regarding cessation and, most importantly, they must be followed-up for at least one year (p. 12).

Mobile Clinics in KSA

Rasooldeen (2014) offers a highly informative review of an innovative strategy to smoking cessation efforts in KSA. As of 2005, the Ministry of Health (MOH), the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) joined forces in the interest of public health and wellness by developing a fleet of mobile smoking cessation clinics in addition to the 44 existing stationary clinics. Ali Alwadey, the current director of the ministry's Tobacco Control Programme (TCP) voiced his support of this program and started a study of smoking habits spanning 8,000 families in the KSA. Alwadey stated that 10 mobile cessation clinics would be put into practice over the next year in order to establish a liaison between public and private divisions of the community to promote smoking cessation (Rasooldeen, 2014, para. 5 & 6).

The mobile service intends to frequent a multitude of public places, such as shopping centers and public recreation areas, which are typically populated by smokers. Its goal is to educate smokers on the health hazards of nicotine addiction and inform them

of their options for smoking cessation. KSA ranks fourth in the world in tobacco imports and consumption (which comes to 15 billion cigarettes-worth $168 million) according to figures from the Gulf Cooperation Council's Health Ministers Council" (Rasooldeen, 2014).

The article entitled "Ministry program helps over 2,000 to quit smoking" offers hope for the health and well-being of Saudi Arabian citizens in their smoking cessation efforts. Dr. Ali-Alwaide stated that the Tobacco Control Programme's (TCP) mobile cessation clinics have been instrumental in assisting 2,296 male and females in quitting smoking. Additionally, 8,575 (88.3%) of the 9,710 mobile clinic visitors were female smokers (para. 1). This unusually high percentage turnout of female smokers that is uncharacteristic of past smoking cessation programs, indicating that Saudi Arabian females may feel more comfortable visiting mobile clinics because the degree of discretion allows them to preserve their modesty. This revelation could possibly be a breakthrough in smoking cessation for a significant portion of the Saudi Arabian population. Upwards of 58 cessation clinics are located in Riyadh, Jeddah, the Eastern Province, Makkah, Madinah, Taif, Asir, Najran, Jazan and Jouf, and they are rather popular with individuals who are apprehensive about entering stationary smoking cessation centers. Regarding female smokers, Kawthar Al-Shidwi, head of media and public relations at the TCP stated that mobile cessation clinics now have separate partitions for males and females in addition to female medical professionals. These cohesive service adjustments are designed to provide female smokers with the privacy that they desire (para. 7).

The article on the recent success of mobile smoking cessation clinics in KSA titled, "MOH Opens De-Addiction Clinics for Smokers," provides additional support for the contention that Saudi Arabian females are more likely to seek help for their smoking addictions in venues where their privacy is respected and upheld by professionals. The clinics, which move to different locations once every few months, strive to educate Saudi citizens on the hazards of smoking in addition to placing anti-smoking messages and sentiments around popular smoking rendezvous locations. Most importantly, these clinics are equipped with trained medical professionals whose goals are to curb smoking addiction, perform follow-ups and conduct beneficial studies. The clinics feature a specially-equipped section for female smokers staffed by female doctors and experts.

Stationary Cessation Clinics in KSA

Alturki (2011) conducted a study of 500 male subjects who volunteered to attend seven smoking cessation clinics in the Riyadh region of KSA. These clients had to complete a survey regarding their opinions of the efficacy of the Tobacco Control Programme (TCB) in KSA. Additionally, the clinical healthcare workers (HCWs) were given a comparable questionnaire. This information was supplemented by a number of interviews with ten clients and ten additional healthcare professionals. The authors express the goal of assessing the smoking cessation program, evaluating its effectiveness by examining its different aspects (Alturki, 2011). The conclusions succinctly state that the purpose of the study is to inform MOH officials who are in charge of developing methods of controlling the proliferation of smoking of the six TCP policies. These policies are based on enforcement of smoking regulation laws in the places of business (Alturki, 2011, p. 78).

The objective of the study performed by Fung *et* al. (2005) from 2000-2002 was to investigate smoking cessation programs in hospitals and determine which methods were most successful in promoting long-term self-discipline and restrain. Subjects included 216 smokers and a control group of 187 people who had never smoked. The authors hypothesized that mental, demographic and reliance factors could indicate projected rates of abstinence in a clinical smoking cessation program. Furthermore, the hypothesis speculated that differences in certain social factors would be inherent to smokers and people who have never smoked (Fung *et* al., 2005). The intervention consisted of a standard, behavioral modification program that entailed in-person counseling sessions, education on the health hazards of smoking and benefits of quitting and components of maintaining abstinence from smoking. Counselors also focused on individual triggers and nuances of patient smoking habits. For heavier smokers, the inclusion of nicotine replacement therapy (NRT) was recommended. Follow ups and continued counseling were conducted via telephone on a weekly basis after completion of the initial phase of the program. Demographic and social factors indicated that in comparison to never smokers, smokers were more likely to live with smokers and began smoking at an average of 16 years old. At the twelve month follow up, 32% of the 216 smokers who had undergone the smoking cessation program were not smoking (Fung et al., 2005). Multivariate analysis cited age, packs per year, gender, existence of a heart condition, confidence or lack thereof about being able to give up, siblings smoked, living with smokers as factors in long-term abstinence. The authors concluded that a hospital-based cessation program is equally as effective as programs, trials and studies conducted in alternate clinical venues.

Gender and Smoking in KSA

Koura, Al-Dassary & Bahnassy (2011) studied the smoking habits of young Saudi Arabian women in the city of Dammam in their cross-sectional study conducted among 1,020 female students handpicked from the literature and science colleges via multi-stage, stratified, random sampling methods with proportional distribution. Data was collected through a self-given, specifically-tailored WHO Global Youth Tobacco Survey questionnaire. Smoking cessation advocates hope that educating women on specific health hazards will play a role in their motivation to quit smoking.

Smoking is on the rise among KSA women. The authors stress the urgency of this dangerous trend when they compare their study with recent studies. They reported that these statistics were markedly higher than those of previous studies, particularly those in Riyadh, which featured results between 5.6% and 6.3% for female college students. These studies indicated an escalating smoking prevalence among female students in KSA (Koura, Al-Dassary & Bahnassy, 2011, p. 66). They conclude that comprehensive health information programs must be implemented for KSA females at the middle school level in addition to the establishment of smoking cessation clinics at the college level. Also, the government must take on the responsibility of instating more severe systems of tobacco control (Koura, Al-Dassary & Bahnassy, 2011, p. 67).

Merdad, Al-Zahrani & Farsi (2007) discuss gender issues of smoking in KSA. Generally, the prevalence of smoking among women is consistently lower than men in both developing and developed nations, but the smoking rates for women in the developing world have risen and continue to rise, and they too make up a large part of the epidemic (Merdad, Al-Zahrani & Farsi, 2007). This cross-sectional study involved a

questionnaire given to 1050 dental, medical and science students ages 18-26 years. The study focused on the prevalence and smoking trends of female Saudi students at King Abdulaziz University in Jeddah city. Data management and evaluation were executed via an SPSS statistical program, and a Chi-square test was employed to compare demographic factors. Of the 95.5% of participants that responded, results revealed that 11% were current smokers, of whom 5% were cigarettes smokers, 8.7% were users of the water pipe (i.e. museal, shisha) and other tobacco products and 2.7% smoked both cigarettes and other tobacco products (Merdad, Al-Zahrani & Farsi, 2007). The only aspect that could be linked to smoking prevalence in this study was high income level. This observation most likely has to do with the cost of maintaining this habit.

Case definitions

The CDC defines current smokers as those who have had 100 cigarettes in their lifetime and currently smoke cigarettes every day (daily) or some days (nondaily). In this study, visitors to the cessation clinics only needed to self-identify as smokers and did not need to specify the frequency of their habit.

Chapter 3 –Manuscript

Abstract

Background: Smoking rates in the Kingdom of Saudi Arabia (KSA) have increased over the past decade. This has led the Ministry of Health (MoH) to establish a Tobacco Control Program to eradicate tobacco use. According to a national survey in 2010, 37% of males and 6% of females were smokers; rates that have more than doubled compared to those 10 years earlier. The Tobacco Control Program has instituted a new approach of using mobile smoking cessation clinics (MSCC) to help those who want to quit. We compared the efficacy of the MSCC and fixed clinics by measuring number of visitors and attempts at quitting.

Methods: Participants attending the Tobacco Control Program smoking cessation clinics in 19 health regions of KSA between July 2014 to July 2015 were surveyed. Ten regions had both mobile and fixed clinics and nine had only fixed clinics. We examined the overall number of participants, the number visiting each clinic type; by gender, region, age group, and smoking status (first-time quitters and those who had previously attempted).

Results: From July 2014 – July 2015, 30,210 KSA participants attended smoking cessation clinics. Over half (16,376; 54%) attended fixed clinics and 46% (13,834) attended mobile ones; 94% (28,330) were male and 6% (1,880) were female. Fixed clinics were chosen by 56% (15,912) of the men, and by 25% (464) of women. In contrast, mobile clinics were chosen by 75% (1,416) of women and 44% (12,418) of men.

Conclusion: MSCC were more accessible and appealing to certain demographic elements of the KSA population than fixed ones. However both foster an environment of safety, comfort, and confidentiality.

Introduction

The smoking epidemic is a significant public health concern. Around 6 million people a year are killed because of tobacco. The cause of 83% of these deaths is direct tobacco use; others result from exposure to secondhand smoke. Tobacco-related illness and death are common in low and middle-income countries, and 80% of smokers live in these countries. The published literature confirms the relationship between smoking and serious health problems like cardiovascular disease and cancers in most parts of the body. The harms of smoking can extend to smokers' families, friends, and the community.

The Kingdom of Saudi Arabia (KSA) is a developed country in which smoking is on the rise. Based on a national survey conducted between 1990 and 1993, the prevalence of smoking among males was 21.1% and 0.9% among females. By 2010, this prevalence had almost doubled among males to 37% and risen to 6% among females, an extreme jump. Saudis smoke cigarettes and hookah, with cigarette use most common among males, and hookah among females. The impact of tobacco extends further than morbidity and mortality and results in significant social and economic costs (Almutairi, 2015).

The KSA Ministry of Health (MoH), in cooperation with the WHO, established the Tobacco Control Program in 2003, which aims to minimize and eradicate tobacco use by raising awareness about the harms of smoking and providing scientific and advisory services on smoking. Smoking cessation clinics are part of the program's services for helping the Saudi population quit smoking. They provide treatment and follow up for smokers attempting to quit. These clinics are scattered throughout KSA. In 2014, the Tobacco Control Program added a new approach. In about half the health regions, they

added mobile clinics. These clinics move (roughly every month) and set up at places frequented by large numbers of the public like malls. The goal the mobile clinics is to provide treatment and awareness and help smokers who cannot reach fixed clinics.

All of the regions of KSA have Tobacco Control Program smoking cessation clinics. KSA is divided into 19 health regions: 10 have both mobile and fixed clinics and 9 have only fixed clinics. The seven regions that do not have the mobile clinic program are Alahas, Albaha, Alqaseem, Alqurrayat, Bishah, Hail, and Northern Borders.

The objectives of this study were to determine the number of participants to smoking cessation clinics, the number of participants to each clinic type (fixed or mobile), the number of participants by gender, by region, by age group, and by smoking status (first-time quitters and those who had attempted previously) from July 2014 – July 2015. With this, we hope to see which type of clinic is more accessible to the general population and particular demographic segments like age and gender.

Methods

Our study focused on a comparison between the mobile and fixed clinics by number of participants. This study's findings were based on data from Tobacco Control Program gathered from different regions of KSA. The dataset provided information about number of participants to smoke cessation clinics and did not count the visits themselves, just unique participants.

This study included anyone eligible for smoking cessation services; this included Saudi and non-Saudi males and females. All smokers lived in KSA and went to smoking cessation clinics during the study period.

Data Collection

Data were collect during the visits and inside anti-smoking clinics. A structured questionnaire modified by the Tobacco Control Program (TCP), originally developed from the World Health Organization (WHO), was administered. The Tobacco Control Program sent the data collected from the cessation clinics to the MoH. We analyzed the data between July 2014 and July 2015.

Study Variables

Data from 19 health regions of KSA, all of which had fixed or mobile anti-smoking clinics included case number, demographics, prevalence of cigarette smoking, reasons for smoking, and how many times the patient had previously attempted to stop. Variables were categorical except for age, which was continuous. The data from multiple choice questions were entered as single numerical values representing choices or

combined numerical values with text values (Yes and No). The respondents could add information by free text response for "reason for smoking" or "attempts to quit smoking."

The initial dataset contained three aliases for Riyadh that were recoded. One of the health regions, Hafr Al-Batin, was not included in the original dataset because that region did not report any data. The small region of Alqunfuda was re-coded to be part of Makkah. The binomial dependent variable of clinic type (fixed or mobile) was created from the region and clinic variable.

Statistical Analysis

Data cleaning was conducted in Microsoft Excel™ 2016 (Microsoft, Seattle, WA) and descriptive statistics and statistical analyses were performed using SAS 9.4 (Cary, NC). An exploratory analysis of data was made and summary statistics for all independent variables were derived. Continuous variables were summarized with descriptive statistics (N, mean, and standard deviation). Categorical variables were summarized with frequency counts and percentages with each category or between levels of a category as appropriate. Chi-Square of Fisher's Exact tests were used to estimate associations between dependent variable and independent variables.

Ethical Considerations

The MoH's Tobacco Control Program provided legal permission for the study. We used secondary data that was de-identified before it was made available for analysis. This study did not meet the definition of human subjects research because it does not include any identifiers that might link us to patients. Therefore, it was not subject to review by the Emory IRB.

Results

From July 2014 – July 2015, there were 30,210 participants in cessation clinics in KSA (Table 1). Over half of smokers (54.21%, 16,376) chose fixed clinics and 45.79% (13,834) chose mobile clinics. This included all regions, some with only fixed clinics. Among total participants, 93.78% (28,330) were male and 6.22% (1,880) were female. Fixed clinics were chosen by 56.17% (15,912) of men, and by 24.68% (464) of women. In contrast, mobile clinics were chosen by 75.32% (1,416) of the women and by 43.83% (12,418) of men.

Among the regions with both fixed and mobile clinics, there were several with high proportions of smokers choosing the mobile clinics (Figure 2). All of the clinic visitors in Aljouf (459 visitors, 100%) chose the mobile clinic over the fixed clinic. In these regions, more smokers chose mobile clinics than fixed clinics: Jeddah (93.93%, 4,395 visitors), Eastern Region (75.88%, 777 visitors), Asser (51.96%, 146 visitors), Jizan (51.11%, 531 visitors), and Riyadh (50.98%, 2,846 visitors). In other regions, smokers chose fixed clinics over mobile clinics or there were not any mobile clinics.

In five of the ten regions with both mobile and fixed clinics, male smokers chose to visit the fixed clinics over the mobile clinics: in Najran, 76.89% (1,211 visitors) of male smokers went to fixed clinics versus mobile clinics, 63.65% (1,912 visitors) in Taif, 64.84% (2,102 visitors) in Almadina, 58.27% (2,236 visitors) in Makkah, and 52.60% (2,696 visitors) in Riyadh (Table 3).

Out of the ten regions with both fixed and mobile clinics, female smokers chose mobile over fixed clinics in seven of those regions: in Aljouf, 100% (11 visitors) of female smokers went to mobile clinics versus fixed clinics, 95.43% (459 visitors) in

Jeddah, 92.19% (59 visitors) in Almadina, 91.05% (417 visitors) in Riyadh, 86.49% (32 visitors) in Eastern region, 81.28% (165 visitors) in Taif, and 55.63% (252) in Makkah (Table 4).

By age, the two groups that visited smoking cessation clinics more than others were those aged 26-30 and 31-40 among both males and females (Table 5). Among females, almost all age groups of smokers visited the mobile clinics more than the fixed clinics. The two age groups that visited the mobile cessation clinics at the highest proportions were those aged 31-40 and over 60. The single group that visited fixed clinics more mobile clinics consisted of those aged 51-60 (Table 6). Among males, those in all age groups except two chose fixed clinics over mobile clinics. The groups who chose the fixed clinics at the highest proportion were aged 26-30 and 31-40. The two groups who visited mobile clinics more than fixed clinics were aged 10-15 and over 60 (Table 7).

Among the clinic visitors, there were smokers who were attempting to quit for the first time and those who had attempted to quit before, as seen in Table 8. Overall, we see that those quitting for the first time chose the fixed clinics (58.85%, 12,122) over the mobile clinics (41.15%, 8,476). Smokers who had attempted to quit before chose the mobile clinics (55.74%, 5,358) over the fixed clinics (44.26%, 4,254).

Of female smokers attempting to quit for the first time, 73.61% (1,018) visited mobile clinics, compared to 26.39% (365) who visited fixed clinics ($p=0.0043$) (Table 9). On the other hand, 61.19% (11,757) of male smokers attempting to quit for the first time visited fixed clinics, and 38.81% (7,458) visited mobile clinics ($P<.0001$)(Table 10).

The males who had attempted to quit before visited the mobile clinics (54.42%, 4,960) more than fixed (45.58%, 4,155). Female smokers who had attempted to quit before visited the mobile clinics at a much higher rate (80.08%, 398) than the fixed clinics (19.92%, 99).

Discussion

This study aimed to examine patterns of usage between fixed and mobile smoking cessation clinics throughout KSA based on data from the Tobacco Control Program. There were 30,210 visitors to cessation clinics between July 2014 and July 2015, with just over half of the participants choosing the fixed clinics overall. The percentages of visitors to fixed and mobile clinics were quite close considering that nine regions do not have mobile clinics. Males made up 93.78% of the visitors to smoking cessation clinics and females made up 6.22%. Overall, the smoking rate among men is higher than that among women. Men usually start smoking years earlier than women. In addition, female smoking has not been socially acceptable until recently. Smoking has generally been perceived negatively for anyone, but more so for women. The number of female visitors to cessation clinics is fewer than that of male visitors because in developing countries where there is a strong influence of culture and tradition, the prevalence of smoking among women is consistently lower than men, but these rates are changing and increasing among women in the developing world (Merdad, Al-Zahrani & Farsi 2007).

A multitude of empirical and analytical studies exist on the smoking habits of males, more than for females. In spite of the range of information regarding the smoking habits of Saudi Arabian females, accurate estimates of the number of the female smokers are scarce. These women are in desperate need of smoking cessation programs that allow them to uphold their beliefs, practice modesty, and maintain their privacy.

Overall, our results demonstrated that a much higher percentage of female smokers (75.32%, 1,416) visit mobile clinics compared with those visiting fixed clinics (24.68%, 464). The mobile clinics are often located at malls, where women frequently

go, giving them ready access to these services. On the other hand, fixed clinics can be found near primary healthcare centers, to which it is more difficult to arrange transportation. Also, there are only one to three fixed clinics per region. Another issue is privacy. Women rely on their male family members or on drivers for access to transportation. As mentioned above, smoking is not socially acceptable for women, so it is easier for them to go to the mall and visit a mobile clinic than to ask someone to take them to a fixed clinic for this purpose. There are 10 regions with fixed and mobile clinics. We found that females chose mobile clinics over fixed in seven regions: Aljouf, Almadina, Eastern Region, Jeddah, Makkah, Riyadh, and Taif. Some of these regions have higher populations than others (Riyadh, Makkah, and Jeddah). They are more urban and so there is a higher level of education in these areas, which may contribute to more awareness about health services like the Tobacco Control Program. In addition, as mentioned before, females can come to mobile clinics without anyone of their family knowing about it.

Out of the ten regions with both fixed and mobile clinics, males chose fixed clinics in five regions. The differences between the visitors to fixed and mobile clinics in some regions was very narrow, which reflects that the easy access to mobile clinics encourages a huge number of smokers who are thinking about quitting to come see what the mobile clinics provide. The choice of fixed clinics among men may be due to their better access to transportation. Men may also prefer mobile clinics (at malls) for a similar reason that females prefer them, for the privacy. Some men's families may not know that they are smokers.

According to our study, there was a difference in the proportions of clinic visitors from different age groups. Among women, those aged 21-40 generally chose mobile clinics over fixed clinics. This age group has more awareness of the harms of smoking. Also, at this age, they are marrying and starting families, and they may want to make a lifestyle change. Among men, those aged 21-40 generally chose fixed clinics for the same reasons, and they have access to transportation so they can go to this type of clinic more easily.

Overall, those attempting to quit for the first time chose fixed clinics over mobile clinics. However, these numbers do include data from the nine regions with only fixed clinics. Despite the higher number of smokers attempting to quit for the first time choosing fixed clinics, the difference between it and the percentage of first-time quitters going to mobile clinics is not large. If mobile clinics were located in all the health regions, we would likely see more visitors to the mobile clinics.

Female smokers attempting to quit for the first time and having already made attempts to quit before both chose mobile clinics over fixed clinics, but the ones who had tried quitting before chose mobile clinics at a higher rate. Interestingly, male smokers attempting to quit for the first time chose fixed clinics (61.19%, 11,757) over mobile clinics, but more of those who had already made attempts to quit before chose mobile clinics (54.42%, 4,960) than fixed clinics. Both men and women chose mobile clinics for subsequent attempts to quit because these clinics were in places like malls where people spend at least part of their time, so they would see the clinics even if they did not have it in their minds to go. For everyone, seeing mobile clinics may encourage their desire to stop smoking and try again.

Strengths and Limitations

The main strength of this study was the fact it was first to compare effectiveness of mobile clinics and fixed clinics. This supports other studies in smoking behavior among the Saudi population that identify the best methods for helping to eradicate smoking. One limitations is that mobile clinics are distributed in 10 of the 19 health regions, so we cannot make comparisons for all regions. Another limitation is underreporting. For example, the Hafr Al-Batin region did not report any data to the Tobacco Control Program, so that region was not included in the original dataset. In addition, the Al-Jouf region reported 100% participation in the mobile clinic and none in the fixed clinic, which may reflect inaccurate data.

This study contends that although fixed cessation clinics are effective to a certain degree, an influx in the availability of and accessibility to mobile cessation clinics will foster an environment of safety, comfort and confidentiality for the female smokers. Furthermore, mobile clinics can succeed in limiting and eradicating the smoking habits of parents, older family members and authority figures will positively affect and reverse the smoking propensity of Saudi Arabian youths.

All members of the KSA population should be aware of smoking's risks and the availability of cessation services. Hopefully, the information in this study will prompt individuals to become involved in collective efforts at improving and preserving their health and the health of younger generations.

Chapter 4 – Conclusions and Recommendations

Smoking in KSA is on the rise, especially among females and youth. This study contends that although fixed cessation clinics are effective to a certain degree, an influx in the availability of and accessibility to mobile cessation clinics will foster an environment of safety, comfort and confidentiality for the female smokers. Furthermore, mobile clinics can succeed in limiting and eradicating the smoking habits of parents, older family members and authority figures will positively affect and reverse the smoking propensity of Saudi Arabian youths.

A number of recommendations can help to limit distribution or eradicate of smoking habit by putting strategies and efforts that consider to control smoking among Saudi population males and females, increase number of anti-smoking clinics (mobile and fixed) to include all regions in Saudi Arabia, new approaches like the mobile clinics are crucially important in light of the smoking trends among women and young people in KSA.

Another recommendation is to link the cessation clinics with the nearest primary care clinic so smokers can easily follow up at a clinic and so their records can be shared.

Educational and media programs are needed to increase awareness of tobacco control programs.

More studies about cessation approaches should be conducted and what their impacts are in relation to smokers' social, health and economic status. Collecting more information on smoker habits, reasons for using a particular type of clinic, and follow up

data on outcomes are all important steps for seeing if the type of clinic has an effect on stopping smoking.

All members of the KSA population should be aware of smoking's risks and the availability of cessation services. Hopefully, the information in this study will prompt individuals to become involved in collective efforts at improving and preserving their health and the health of younger generations.

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Tables

Table 1. Participants of Fixed and Mobile Clinics, by Gender, Kingdom of Saudi Arabia, 2014 – 2015

Clinic Type	*Female*	*Male*	*Total*
Fixed	464	15912	16376
	1.54	52.67	54.21
	2.83	97.17	
	24.68	56.17	
Mobile	1416	12418	13834
	4.69	41.11	45.79
	10.24	89.76	
	75.32	43.83	
Total	1880	28330	30210
	6.22	93.78	100.00

Table 2. Participants of Fixed and Mobile Cessation Clinics by Region, Kingdom of Saudi Arabia, 2014 – 2015

Region	*Fixed*	*Mobile*	*Total*
Al-Ahsa	93	0	93
	0.31	0.00	0.31
	0.57	0.00	
	100.00	0.00	
Al-Baha	627	0	627
	2.08	0.00	2.08
	3.83	0.00	
	100.00	0.00	
Al-Jouf	0	459	459
	0.00	1.52	1.52
	0.00	3.32	
	0.00	100.00	
Al-Madina	2107	1200	3307
	6.97	3.97	10.95
	12.87	8.67	
	63.71	36.29	
Al-Qaseem	222	0	222
	0.73	0.00	0.73
	1.36	0.00	
	100.00	0.00	
Al-Qurrayat	196	0	196
	0.65	0.00	0.65
	1.20	0.00	
	100.00	0.00	
Aseer	135	146	281
	0.45	0.48	0.93
	0.82	1.06	
	48.04	51.96	
Bishah	105	0	105
	0.35	0.00	0.35
	0.64	0.00	
	100.00	0.00	

Region	*Fixed*	*Mobile*	*Total*
Eastern Region	247	777	1024
	0.82	2.57	3.39
	1.51	5.62	
	24.12	75.88	
Hail	370	0	370
	1.22	0.00	1.22
	2.26	0.00	
	100.00	0.00	
Jeddah	284	4395	4679
	0.94	14.55	15.49
	1.73	31.77	
	6.07	93.93	
Jizan	508	531	1039
	1.68	1.76	3.44
	3.10	3.84	
	48.89	51.11	
Makkah	2437	1853	4290
	8.06	6.13	14.20
	14.88	13.39	
	56.80	43.20	
Najran	1213	370	1583
	4.02	1.22	5.24
	7.41	2.67	
	76.63	23.37	
Northern Borders	2390	0	2390
	7.91	0.00	7.91
	14.59	0.00	
	100.00	0.00	
Riyadh	2737	2846	5583
	9.06	9.42	18.48
	16.71	20.57	
	49.02	50.98	

Region	*Fixed*	*Mobile*	*Total*
Tabouk	755	0	755
	2.50	0.00	2.50
	4.61	0.00	
	100.00	0.00	
Taif	1950	1257	3207
	6.45	4.16	10.62
	11.91	9.09	
	60.80	39.20	
Total	16376	13834	30210
	54.21	45.79	100.00

Table 3. Male Participants of Fixed and Mobile Cessation Clinics by Region, Kingdom of Saudi Arabia, 2014 – 2015

Region	*Fixed*	*Mobile*	*Total*
Al-Ahsa	93 100.00	0 0.00	93
Al-Baha	627 100.00	0 0.00	627
Al-Jouf	0 0.00	448 100.00	448
Al-Madina	2102 64.82	1141 35.18	3243
Al-Qaseem	221 100.00	0 0.00	221
Al-Qurrayat	191 100.00	0 0.00	191
Aseer	135 48.04	146 51.96	281
Bishah	103 100.00	0 0.00	103
Eastern Region	242 24.52	745 75.48	987
Hail	370 100.00	0 0.00	370
Jeddah	262 6.24	3936 93.76	4198
Jizan	489 48.66	516 51.34	1005
Makkah	2236 58.27	1601 41.73	3837
Najran	1211 76.89	364 23.11	1575
Northern Borders	2274 100.00	0 0.00	2274
Riyadh	2696	2429	5125

	52.60	47.40	
Tabouk	748	0	748
	100.00	0.00	
Taif	1912	1092	3004
	63.65	36.35	
Total	15912	12418	28330

Table 4. Female Participants of Fixed and Mobile Cessation Clinics by Region, Kingdom of Saudi Arabia, 2014 – 2015

Region	*Fixed*	*Mobile*	*Total*
Al-Ahsa	0	0	0
Al-Baha	0	0	0
Al-Jouf	0	11 100.00	11
Al-Madina	5 7.81	59 92.19	64
Al-Qaseem	1 100.00	0	1
Al-Qurrayat	5 100.00	0	5
Aseer	0	0	0
Bishah	2 100.00	0	2
Eastern Region	5 13.51	32 86.49	37
Hail	0	0	0
Jeddah	22 4.57	459 95.43	481
Jizan	19 55.88	15 44.12	34
Makkah	201 44.37	252 55.63	453
Najran	2 25.00	6 75.00	8
Northern Borders	116 100.00	0	116
Riyadh	41 8.95	417 91.05	458

Region	*Fixed*	*Mobile*	*Total*
Tabouk	7 100.00	0	7
Taif	38 18.72	165 81.28	203
Total	464	1416	1880

Table 5. Visitor Participants of Fixed and Mobile Cessation Clinics by Age, Kingdom of Saudi Arabia, 2014 – 2015

Gender	*10 - 15*	*16 - 20*	*21 - 25*	*26 - 30*	*31 - 40*	*41 - 50*	*51 - 60*	*Over 60*	*Total*
Female	163	87	193	200	234	121	41	377	1416
	1.18	0.63	1.40	1.45	1.69	0.87	0.30	2.73	10.24
	11.51	6.14	13.63	14.12	16.53	8.55	2.90	26.62	
	16.43	10.48	10.41	9.53	8.50	11.56	12.28	9.60	
Male	829	743	1661	1898	2518	926	293	3550	12418
	5.99	5.37	12.01	13.72	18.20	6.69	2.12	25.66	89.76
	6.68	5.98	13.38	15.28	20.28	7.46	2.36	28.59	
	83.57	89.52	89.59	90.47	91.50	88.44	87.72	90.40	
Total	992	830	1854	2098	2752	1047	334	3927	13834
	7.17	6.00	13.40	15.17	19.89	7.57	2.41	28.39	100.00

Table 6. Female Participants of Fixed and Mobile Cessation Clinics by Age, Kingdom of Saudi Arabia, 2014 – 2015

	10 - 15	*16 - 20*	*21 - 25*	*26 - 30*	*31 - 40*	*41 - 50*	*51 - 60*	*Over 60*	*Total*
Fixed	19	12	64	78	111	93	47	40	464
	1.01	0.64	3.40	4.15	5.90	4.95	2.50	2.13	24.68
	4.09	2.59	13.79	16.81	23.92	20.04	10.13	8.62	
	10.44	12.12	24.90	28.06	32.17	43.46	53.41	9.59	
Mobile	163	87	193	200	234	121	41	377	1416
	8.67	4.63	10.27	10.64	12.45	6.44	2.18	20.05	75.32
	11.51	6.14	13.63	14.12	16.53	8.55	2.90	26.62	
	89.56	87.88	75.10	71.94	67.83	56.54	46.59	90.41	
Total	182	99	257	278	345	214	88	417	1880
	9.68	5.27	13.67	14.79	18.35	11.38	4.68	22.18	100.00

Table 7. Male Participants of Fixed and Mobile Cessation Clinics by Age, Kingdom of Saudi Arabia, 2014 – 2015

	10 - 15	*16 - 20*	*21 - 25*	*26 - 30*	*31 - 40*	*41 - 50*	*51 - 60*	*Over 60*	*Total*
Fixed	208	1500	2543	3121	4447	1912	716	1465	15912
	0.73	5.29	8.98	11.02	15.70	6.75	2.53	5.17	56.17
	1.31	9.43	15.98	19.61	27.95	12.02	4.50	9.21	
	20.06	66.87	60.49	62.18	63.85	67.37	70.96	29.21	
Mobile	829	743	1661	1898	2518	926	293	3550	12418
	2.93	2.62	5.86	6.70	8.89	3.27	1.03	12.53	43.83
	6.68	5.98	13.38	15.28	20.28	7.46	2.36	28.59	
	79.94	33.13	39.51	37.82	36.15	32.63	29.04	70.79	
Total	1037	2243	4204	5019	6965	2838	1009	5015	28330
	3.66	7.92	14.84	17.72	24.59	10.02	3.56	17.70	100.00

Table 8. Participants of Fixed and Mobile Cessation Clinics by Smoking Status (Previously Attempted to Quit), Kingdom of Saudi Arabia, 2014 – 2015

Clinic Type	*No*	*Yes*	*Total*
Fixed	12122	4254	16376
	58.85	44.26	
Mobile	8476	5358	13834
	41.15	55.74	
Total	20598	9612	30210

Table 9. Female Visitors to Fixed and Mobile Cessation Clinics by Smoking Status (Previously Attempted to Quit), Kingdom of Saudi Arabia, 2014 – 2015

	No	*Yes*	*Total*
Fixed	365	99	464
	26.39	19.92	
Mobile	1018	398	1416
	73.61	80.08	
Total	1383	497	1880

Table 10, Male Visitors to Fixed and Mobile Cessation Clinics by Smoking Status (Previously Attempted to Quit), Kingdom of Saudi Arabia, 2014 – 2015

	No	*Yes*	*Total*
Fixed	11757	4155	15912
	61.19	45.58	
Mobile	7458	4960	12418
	38.81	54.42	
Total	19215	9115	28330