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COLLEGE AGE FEMALE SMOKERS AND THE EFFICACY OF SMOKING  
CESSATION ON COLLEGE CAMPUSES

A thesis submitted In  
Partial Fulfillment of the Requirements  
for the Degree  
Master of Science  
at Minnesota State University, Mankato

by  
Gretchen S. Strobel

July 2012

COLLEGE AGE FEMALE SMOKERS AND THE EFFICACY OF SMOKING  
CESSATION ON COLLEGE CAMPUSES

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## ACKNOWLEDGEMENTS

This thesis is dedicated to Katie “Joy” Clower.

## ABSTRACT

### COLLEGE AGE FEMALE SMOKERS AND THE EFFICACY OF SMOKING CESSATION ON COLLEGE CAMPUSES

STROBEL, GRETCHEN S. M.S. in Nursing, Minnesota State University, Mankato, 2012. 63pp.

Young females are smoking on campuses in increasing rates in the last two decades. This thesis is secondary data analysis of a primary study with data from 472 female respondents, ages 18 to 24, enrolled or registered for classes at Minnesota State University, Mankato in the Spring, Summer and Fall semester of 2011. This sample included current smokers, former smokers, and nonsmokers. This research study will discuss the relationship between the age one starts smoking and any association with participation in unprotected intercourse and the concomitant use of estrogen containing oral contraceptives. Among the respondents a majority started smoking between the ages 14 to 19. Among current and former smokers, there was positive association among females, ages 14 to 15, and participation in unprotected intercourse. Among current and former smokers, there was no association or preference to use estrogen containing oral contraceptives. Using Pearson's chi-square analysis, there was no statistically significant relationship among age one starts smoking and (a) participation in unprotected intercourse and (b) use of estrogen containing oral contraceptives. The percentage of females receiving smoking cessation advice from providers ranged from 26% among current smokers to 29% among former smokers. However, not all young female smokers disclosed their current smoking status to their providers. Future research should capture a more diverse dataset to improve interventions based on prevalence in various ethnic groups.

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## **CHAPTER I**

### **INTRODUCTION**

Upon entering college, many young females experience a newfound freedom of expression. For some this may mean considering a new major or joining a campus political party. For other students, freedom of expression may consist of high-risk activities that can jeopardize one's health, such as using tobacco, in the form of smoking cigarettes. On college campuses, the rates of smoking among young females have increased over the last 2 decades (Rigotti, Lee, & Wechsler, 2000). Furthermore, earlier ages of initiating smoking can be related to concurrent or future high-risk behaviors such as unprotected sexual intercourse. Is there a relationship between the onset of smoking and the use of oral contraceptives containing estrogen among female smokers? On college campuses, are young females queried about their smoking status and their interest in quitting by providers? If so, there must be a consistent intervention by providers.

#### **Problem Statement**

College students, ages 18 to 24, smoke more than any other age group in the United States (U.S. Department of Health and Human Services [USDHHS], 2010b). Young females, who currently outnumber young males on college campuses, are smoking with increasing frequency. Cigarette smoking in young college females is associated with other high-risk behaviors such as excess alcohol use and unprotected sexual intercourse (Nichter et al., 2006).

Young college females are drawn to cigarette smoking for a variety of reasons. For example, marketing in the United States has portrayed females who smoke as healthy and slender (Mackey, McKinney, & Tavakoli, 2008). As a result, many adolescent girls and young females start smoking as early as 13 years old (Eaton et al., 2008), which increases their odds of smoking into adulthood by sixfold (Kenford et al., 2005).

With increasing numbers of young females smoking, providers need to assess students' current and/or past tobacco use. Students should be asked about their interest in and readiness to engage in smoking cessation activities. Currently, providers ask smokers if they are interested in quitting less than 50% of the time (Curry, Sporer, Pugach, Campbell, & Emery, 2007). Enrollment in smoking cessation programs by young female is lower than among young males (VanVolkum, 2008). Therefore, further review of young college females' tobacco use, concurrent high-risk behaviors, and smoking cessation interventions can yield valuable information to improve females' overall health.

### **Purpose of the Study**

The primary study from which these data were collected was a quantitative study utilizing comparative descriptive statistics from a questionnaire by Morris (2011). The secondary data analysis used these data to evaluate relationships between the onset of tobacco use among female college students and participation in unprotected intercourse as well as use of oral contraceptives containing estrogen.

The variables in the primary study included: age (18 through 24 years), smoking status, number of cigarettes smoked per day, family members who smoked, and family members' incidence of serious health consequences related to smoking (Morris, 2011).

Respondents, be they current or former smokers, were also queried about their receipt of health care. These variables included provider visits, smoking cessation advice by provider, and respondents' self-assessment of their own risk for several acute and chronic health conditions. Responses were categorized based on choice of one of the following responses: *below-average risk, average risk, above average risk, or already diagnosed with the condition.*

Additional research questions inquired of respondents about their sexual health and risk factors associated with their smoking or nonsmoking history. These questions provide important data for this secondary data analysis. One question asks the respondents "Have you ever engaged in unprotected intercourse without condoms?" (Morris, 2011, p. 45). Another question that is of primary importance in this secondary data analysis is "Do you use oral contraceptive pills that contain estrogen?" (Morris, 2011, p. 45). Morris' (2011) primary dataset also inquired of long-term sequelae associated with college females' sexual health including "Have you been diagnosed with HPV (human papilloma virus infection) or had an abnormal Pap smear?" (p. 45).

The primary study was based on a convenience sample of 472 females, ages 18 to 24, who were enrolled and/or registered for classes at Minnesota State University, Mankato (MSU, Mankato) during Spring 2011, Summer 2011, and Fall 2011. Minnesota State University, Mankato is primarily a residential campus, with an

enrollment of 15,000 (*Fast facts*, 2012). The surrounding city of Mankato, Minnesota, has a population of 39,109 (U.S. Census, 2010).

The community of Mankato has a median age of 25.4 years old with a demographic profile of the population that is 92.5% Caucasian, 2.8 % Asian or Pacific Islander, 2.4 % Latino or Hispanic, 1.9% African American, and 0.2% mixed ethnicity (U.S. Census, 2010, lines 8-16). Families comprise 51% of the population and are primarily from German, Norwegian, and Swedish heritage (U.S. Census, 2011b). Residents in Mankato make their economic living through educational services, manufacturing, retail, healthcare, arts, entertainment, and accommodation services (U.S. Census, 2011a).

### **Research Questions**

1. What is the relationship between the age that college females start smoking and their participation in unprotected intercourse?
2. What is the relationship between the age that college females start smoking and their use of oral contraceptives containing estrogen?
3. Is smoking cessation advice presented to female students by providers?

### **Definition of Terms**

The following are the conceptual and operational terms used in this study.

**College females. Conceptual definition.** Females enrolled in higher education, ranging in age from teenagers to elderly enrollees.

**Operational definition.** Females enrolled in higher education ranging from 18 through 24 years of age.

**High-risk behaviors. Conceptual definition.** Behaviors that contribute to unintentional injuries and violence, including tobacco use, alcohol and other drug use, sexual behaviors that contribute to pregnancy and STI (including HIV), unhealthy dietary behaviors and physical inactivity (Eaton et al., 2008).

**Operational definition.** Behaviors including tobacco use and abuse, alcohol use and abuse, marijuana use, and sexual behaviors that contribute to sexually transmitted infections and unintended pregnancy.

**Oral contraceptives. Conceptual definition.** An oral form of birth control, taken daily, that can either be a combined estrogen and progestin formulation or a progestin-only formulation that prevents pregnancy by blocking the follicle stimulating hormone to prevent ovulation (Hatcher et al., 2012).

**Operational definition.** A combined estrogen and progestin pill, taken daily by female students, that is used to prevent pregnancy.

**Patient provider relationship. Conceptual definition.** A relationship between a provider and a patient, where the provider assumes or undertakes the medical care or treatment of the patient (*The free dictionary*, 2012).

**Operational definition.** The relationship and rapport that develops between provider and patient to improve the patient's health status.

**Providers. Conceptual definition.** "One that makes something, such as a healthcare services available" (*The free dictionary*, 2012).

**Operational definition.** A health professional such as a physician, an advanced practice nurse (APN), a registered nurse or a behavioral counselor.

**Smoking. Conceptual definition.** The inhalation of the smoke of burning tobacco encased in cigarettes, cigars, or pipes (*The free dictionary*, 2012).

**Operational definition.** The act of inhalation and exhalation of tobacco including cigarettes, clove cigarettes, cigars, and/or pipes.

**Smoking cessation. Conceptual definition.** A temporary or final ceasing of an action (Mish, 1987).

**Operational definition.** Halting nicotine dependence through the use of behavioral or pharmacological therapy.

**College Health Clinic. Conceptual definition.** A health-care facility or institution where medical services are provided, or where a group of providers practices (*The dictionary.com*, 2012).

**Operational definition.** Location where students at the Minnesota State University, Mankato receive care.

**Unprotected sexual intercourse. Conceptual definition.** Engaging in oral, anal, or vaginal intercourse without the use of a condom.

**Operational definition.** Sexual activity without the use of a condom.

### Summary

Young females smoking on college campuses has increased over the last 2 decades. Several negative sequelae can co-occur with tobacco abuse: excessive alcohol use, high-risk sexual behaviors, and multiple health conditions ranging from infertility to asthma to lung cancer. Providers should focus their smoking cessation programs to include the newer demographic of smoker, the young female.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

#### **Introduction**

This chapter provides background information regarding young college females and their tobacco use, primarily in the form of smoking cigarettes. It includes a brief discussion of the increasing numbers of young females on college campuses and a discussion of high-risk behaviors associated with smoking, such as alcohol abuse, unprotected sexual intercourse, and concomitant use of oral contraceptives containing estrogen. The considerations of why young college females choose to smoke are reviewed. Barriers to successful smoking cessation programs are explored, including concerns unique to females, and lack of current provider discussion or intervention to encourage cessation activities.

#### **Young Females in College**

The number of young females enrolled in higher education has steadily increased over the past several decades. In 1947, only 29% of females were enrolled in college or universities (Doyle, 2010). In the 1980s, the gender split in colleges was 50% males and 50% females. By 2006, 56% of students in college were female, an increase of 2% from the previous year (Doyle, 2010).

The increasing number of females enrolled in higher education occurred for a multitude of social and economic reasons. Social capital may be greater among females attending college versus males. Social capital includes factors such as one's ethnicity,

whether a student graduated from high school, and parental expectations or involvement in their academic life (Wells, Seifert, Padgett, Park, & Umbach, 2011). As of 2010, across all ethnic groups, young females have higher rates of graduation from high school than young males (Doyle, 2010). High school graduation is considered a stepping-stone to higher education.

Young females may also be more likely than young males to enroll in college to maximize their earning potential. The financial reality among females in the workplace is that males with only a high school degree are compensated greater than females with some college experience (Doyle, 2010). In order for a woman to avoid this gender inequity and compete effectively for the best wages, she must have a Bachelor's degree. The increasing rate of females graduating high school and continuing to college may contribute to the increasing prevalence of smoking among this population (Rigotti et al., 2000).

### **Young Females and High-Risk Behaviors**

When young females enter college, a newfound personal freedom can influence decisions about social behaviors. For some females, personal freedom means engaging in socially and potentially clinically risky behaviors, such as excessive alcohol consumption, sexual promiscuity, and cigarette smoking, all of which can have life-long deleterious effects.

#### **Alcohol Use**

The frequency of young college females engaging in excessive alcohol use has increased exponentially over the last 50 years. In 1950, 6% of college females had one or more drinks per week (Young, Morales, McCabe, Boyd, & D'Arcy, 2005). In the

1970s, 10% of college females “drank to get drunk” versus 20% of college males. By 2001, 40% of college females admitted to “binge drinking,” defined as drinking four or more drinks in one sitting three times or more in the last 14 days (Young et al., 2005).

Historically, there has been a greater cultural endorsement of males drinking to get drunk as a display of machoism and the ability to outlast one’s peers at the bar. However, in the last 10 years, females have wanted to match their male friends in alcohol consumption. The reasons for this are contradictory. In a 2005 study by Young et al., the first reason given by college females was to equalize gender roles, eliminating a perceived or real inequity of alcohol tolerance between the sexes. A second reason for females to drink more was to improve their social position and attractiveness to male peers (Young et al., 2005).

Alcohol use in college females increases the likelihood of participation in high-risk sexual behavior. The Alcohol Myopia Theory, originally authored in 1990, posits that when one consumes alcohol, attention to one’s most immediate desires, such as those associated with sexual activity, becomes the primary concern. These immediate desires, such as sexual gratification, override inhibitory actions that traditionally uphold social norms (Griffen, Umstatted, & Usdan, 2010). As a result, alcohol use by females can be a means of access to other high-risk behaviors.

### **High-Risk Sexual Behavior**

Among college students, at least 75% are sexually active (Griffen et al., 2010). With increased sexual activity comes responsibility to avoid or minimize high-risk behaviors that could lead to sexually transmitted infections or unintended pregnancy. As of 2010, over half of the STIs diagnosed each year were among 15 to 24 year olds.

However, less than half of college students report consistent condom use during intercourse, despite the fact that condom use can prevent transmission of STIs (Eisenberg, Neumark-Sztainer, & Lust, 2005). Among college students, this lack of condom use demonstrates a limited knowledge and awareness of STIs, as well as a perspective of invulnerability to infection with an STI (Griffen et al., 2010; Ingledue, Cottrell, & Bernard, 2004).

HPV is the most common STI in the United States, with 6.2 million new cases per year (Burke, Vail-Smith, White, Baker, & Mitchell, 2010). In the United States, the overall prevalence of HPV infection among females is 26.5%. Among college females, the prevalence is 45% (Dunne et al., 2007). Of the 40 HPV subtypes associated with anogenital infections, subtypes 6 and 11 are primarily associated with 90% of genital warts, while HPV subtypes 16 and 18 are associated with an increased risk of cervical cancer (Pallecaros & Vonau, 2007).

What is the current state of knowledge among college females of HPV? Gerend and Shephard (2011) queried a diverse group of young college females who had not yet received the HPV vaccine about their knowledge of HPV. Their study reviewed HPV awareness and knowledge in relation to demographics, ethnicity, health history, sexual history, and mores regarding sexual behavior. Among the 734 respondents, less knowledge about HPV was associated with Latina ethnicity and with the variable “[ I am ] opposed to premarital sex” (Gerend & Shephard, 2011, p. 25). Greater knowledge about HPV was associated with sexually active females with a history of an abnormal Pap result (Gerend & Shephard, 2011).

Ingledue et al. (2004) demonstrated that greater knowledge about HPV among the sexually active is not necessarily associated with increased preventive behavior to avoid spreading or acquiring HPV. Ingledue et al. (2004) asked 428 female college students about HPV knowledge and preventive behaviors to avoid HPV. Students completed a questionnaire discussing their risk of getting HPV. The questionnaire asked these young females to rank their susceptibility and seriousness of acquiring HPV infection from 1 (*low*) to 30 (*high*). Among the respondents, they rated their individual susceptibility at 17/30 and the potential for acquiring HPV as 24/30 (Ingledue et al., 2004). As one can see, these young females comprehended the seriousness and potential sequelae of HPV but did not perceive themselves as highly susceptible. Their sexual practices demonstrated this sense of invulnerability. Among these respondents, 79% were sexually active, yet rates of consistent condom use by these college females were very low at 15.6% (Ingledue et al., 2004). This shows a disconnect intellectually among young females' perceived susceptibility versus the reality of an increased likelihood of acquiring HPV from unprotected sexual intercourse.

The combination of young college males and females socializing in the presence of alcohol can increase the likelihood of unprotected intercourse, thus causing unintended pregnancy. Students stated that under the influence of alcohol they were less tolerant to the "reduction of pleasure associated with condom use and also their awareness of danger [of pregnancy] was reduced" (Ingersoll, Ceperich, Nettleman, & Johnson, 2008, p. 977). Half of all unintended pregnancies are due to ineffective condom and contraception use (Ingersoll et al., 2008).

## **Oral Contraceptive Use Among College Females**

Among college females nationwide, approximately 50% are using a form of oral contraceptive to prevent unintended pregnancy (Brunner-Huber & Ersek, 2009). Oral contraceptives have health risks that may be beneficial or potentially harmful. One could argue that the prevalence of contraceptive use among college students contributes to increasing percentages of unprotected intercourse, which can contribute to infection with STIs.

Combined oral contraceptives have been around for the last 50 years using ethinyl estradiol, a synthetic form of estrogen and synthetic progestins to block ovulation and make the cervix inhospitable to sperm. Historically, formulations of oral contraceptives included ethinyl estradiol with levels of as high as 150 mcgs per day with varying levels of progestins. Rates of ethinyl estradiol in today's oral contraceptives are between 30 to 50 mcgs per day. With perfect use of oral contraceptives, the efficacy rate is 99%; with typical use, the effectiveness rate is 91% (Hatcher et al., 2012).

There are both health benefits and risks associated with the use of oral contraceptives. The health benefits extend to decreased risk of endometrial and ovarian cancer, increased bone density, decreased acne, and reduction in the risk of endometriosis and iron-deficiency anemia (Hatcher et al., 2012). Health risks that are associated with oral contraceptive use include an increased risk of venous thromboembolism (VTE). The incidence of a VTE is positively associated with length of time on estrogen-containing oral contraceptives, obesity and a history of smoking (Hatcher et al., 2012).

### **Trends of Tobacco Use Among Young Females**

Whether enrolled in college or not, one of the most common health concerns among health professionals in the United States is the increasing trend of young females smoking. Among college females and males who smoke, the overall prevalence rates are almost equivalent, 28.4% and 28.5%, respectively (Rigotti et al., 2000). As discussed earlier, this relative equality represents an increase in the rates of smoking among young females during the college years. Females, ages 18-24 who do not attend college are twice as likely to smoke; on a daily basis they are also likely to smoke twice the amount of tobacco than their college-attending peers (Green et al., 2007). Across all age groups, more males smoke than females, 21.5% to 17.3% respectively (USDHHS, 2010a, para. 1). Since 2005, there has been a decline in the overall prevalence of smoking among adults (USDHHS, 2011a). However, the trends are not well defined. For example, rates of those smoking more than one pack per day have decreased, while the rates of adults smoking less than 10 cigarettes per day has increased (USDHHS, 2011a).

### **Cigarette Smoking and Nicotine Dependence**

Nicotine is the highly addictive drug that occurs naturally in tobacco products. Immediately after inhaling or chewing nicotine, stimulating and pleasurable effects occur due to nicotine-initiated central nervous system activation and neurotransmitter release in the brain. The stimulating effect of increased alertness is due to the activation of the sympathetic nervous system (Wynne, Woo, & Olyaei, 2007). A pleasurable effect occurs due to the release of dopamine neurotransmitters (Wynne et al., 2007).

The high that results from tobacco is similar to that of other addictive drugs, such as cocaine and amphetamines (Wynne et al., 2007).

Among young females, several factors contribute to developing a lifelong smoking habit. Early exposure to “prosmoking” environments such as parents or peers who are current smokers can be a risk factor for tobacco dependency (Orlando, Tucker, Ellickson, & Klein, 2004). Adolescent smokers are more likely to have parents who smoke (Orlando et al., 2004). Furthermore, if one’s peers smoke cigarettes, this increases their risk of developing a smoking habit (Kenford et al., 2005).

Eaton et al. (2008) demonstrated that among female high school students, tobacco dependence is highest among Caucasian students. In 9th grade, 6.2% of females were daily smokers, and by 12th grade, 17% of females were daily smokers (Eaton, 2008). Tobacco use in late adolescence mirrors the increase in use of tobacco along gender and ethnic groups that is seen among smokers ages 18 to 24.

### **Smoking Dependence and Physiological Effects**

From 1993 to 2008, the prevalence of young college females smoking has grown from 25% to 40% (Mackey et al., 2008). Since 1980, the incidence of lung cancer has increased by 106% among females, while decreasing 22% among males (American Lung Association [ALA], 2012). Morbidity in females due to lung cancer has surpassed males (ALA, 2012). Furthermore, young females who smoke face unique long-term health concerns such as high-risk pregnancy, infertility, and osteoporosis (Mackey et al., 2008).

Tobacco use among females during pregnancy increases the odds that a woman will deliver early and that her infant will have a low birth weight. A prospective cohort

study was conducted of 9,778 smoking and nonsmoking mothers who were followed throughout their pregnancies (Jaddoe et al., 2008). Among 25% of the mothers who continued to smoke nine or more cigarettes or greater daily during pregnancy, the risks of preterm delivery and a small gestational age (SGA) baby were significantly increased as compared to nonsmokers (Jaddoe et al., 2008).

Among females who are trying to get pregnant, previous or current tobacco use increased the chances one would be infertile (Anderson, Nisenblat, & Norman, 2010). Infertility is defined as inability to conceive after 12 months of unprotected intercourse. The byproducts of tobacco use contribute to oxidative stress that damages the cell membrane involved in the creation of healthy cells. This impairs the ovaries' production of viable follicles, thus decreasing fertility rates among females (Anderson et al., 2010). As a young female ages and continues to smoke, she is more likely to lose bone mass faster than a nonsmoker. Smoking decreases the estrogenic activity, which can contribute to osteoporosis. Furthermore, absorption of calcium and other nutrients, such as vitamin D, is also inhibited if a young woman smokes (Hobar, 2011).

### **Smoking Dependence and Psychological Effects**

Societal pressures influence tobacco use among young females. Cigarette smoking by females is a mechanism to control weight and to handle stressful academic situations. The tobacco industry portrays young females who smoke as thin and healthy appearing. This image feeds many young females' dissatisfaction with their body image and desire for weight control (Mackey et al., 2008). Young female smokers are two to four times more likely than nonsmokers to engage in dieting behaviors such as

restricting foods, fasting, and taking diet pills (Mackey et al., 2008). While stress among young college students, female or male, is not a new phenomenon, young females tended to react more to “negative emotions, such as conflict or stress” (Croghan et al., 2006). Croghan et al. (2006) found that among college students, female gender and cigarette use were associated with higher perceived stress levels as compared to males.

### **Factors Influencing Young Females Not to Smoke**

There are a myriad of reasons for college students not to start using tobacco. Concern over one’s health, financial constraints, parental influence, and the unattractiveness of the habit reduce one’s likelihood to start smoking. Maintaining a healthy lifestyle is a primary reason to avoid tobacco use. College students are aware that smoking can decrease one’s life expectancy as respiratory or cardiac problems can cause multiple health problems (McCance & Huether, 2010). Also, the experience of having a loved one die of a smoking related illness influences young people not to smoke (Kelley, Thomas, & Freidman, 2003).

The cost of smoking cigarettes negatively influences a person’s willingness to smoke (Kelley et al., 2003; VanVolkum, 2008). The average cost of a pack of cigarettes in Minnesota is \$5.00 (Minnesota Department of Commerce, 2011). If a student had a one pack per day habit, the cost would be \$150 per month. For many students, \$150.00 would be better applied to a cell phone bill or, Internet service connection, or decreasing the overall student loan debt.

Parental and peer influence impact a young person’s decision to either avoid or start smoking. Nonsmoking parents, as compared to smoking parents, engage in

constructive antismoking discussions to minimize the likelihood of their children smoking (Kelley et al., 2003). Nonsmoking college peers see smoking as unattractive and find the smell and taste of cigarettes as unpleasant thereby reducing their likelihood of smoking (VanVolkum, 2008).

### **Smoking Cessation**

For the purpose of this secondary data analysis, there was not one particular conceptual theory guiding the study and analysis. However, the theory that guides a provider's inquiry into smoking cessation readiness is the Transtheoretical Model of Behavior Change (Fagan, 2007). There are five stages, the first being precontemplation, during which the patient is not at all interested in quitting smoking. The second stage is contemplation, during which the patient is giving consideration to smoking cessation in the next 6 months. The third stage is preparation, during which the patient is ready to quit smoking within 1 month. The fourth stage is an action stage, during which smoking has ceased for less than 6 months. The fifth stage is a maintenance stage during which smoking has ceased for greater than 6 months (Woody, DeCristofaro, & Carlton, 2008).

The provider often assesses a patient's readiness to quit smoking or to discuss smoking cessation strategies. The *Healthy People 2020* smoking cessation goal is to decrease smoking in the United States among adults ages 18 to 24 to 12% of the population (USDHHS, 2010c) as opposed to the overall current rate of 20.1% (USDHHS, 2010a). The American College Health Association's goal is to decrease smoking among college students to 10% or less (Thomas et al., 2008) as compared to the overall rate among college students of 28% (Rigotti et al., 2000).

### **Cessation Programs Among College Students**

Efforts to end tobacco addiction, such as smoking cessation programs and nicotine replacement therapy, are in no danger of running out of customers regardless of age or whether they are enrolled in college setting or living and working in the community, at large. Nationwide, the total number of male and female adult smokers is 46.2 million (Fagan, 2007). Among current smokers, 70% stated they would like to quit (Curry et al., 2007). However, only 5% succeed at quitting (Orleans, 2007).

Providers working at college-based clinics must address smoking cessation goals with their patient population. College students ages 18 to 24 are less likely to succeed at smoking cessation than persons ages 35 and older (Curry et al., 2007). College students have fewer visits to clinics, limiting tobacco cessation interventions. During clinic visits, college students were asked about their smoking status 58% of the time, as compared to 67% of the time for those aged 35 years and older (Curry et al., 2007). Similarly, providers advised patients, ages 18 to 24, to quit smoking at lower rates than the cohort of patients 35 and older (Curry et al., 2007).

College students are in a unique time of their lives when tobacco cessation programs can capitalize on community and provider support. College campuses have enacted policies to eliminate or restrict tobacco exposure. A 2007 study surveyed providers at college health centers. Among the respondents, several of whom were clinic medical directors, 85% considered smoking to be a major health problem on their campuses (Fagan, 2007).

Among college tobacco users, many have not committed to smoking for their lifetime. These tobacco users remain amenable to peer influence, both indirectly and

directly, to encourage smoking cessation activities. Smoking among college students is fluid (Kenford et al., 2005). Research indicated that while up to 25% of college students' transition to regular use, 25% will quit completely (Kenford et al., 2005). Thomas et al. (2008) found that among college students, 54% were willing to act as a defined support to help peers or loved ones quit smoking.

### **Smoking Cessation Among Females**

Female smokers have lower participation and success in smoking cessation programs as compared to males (VanVolkom, 2008). Several physiological and psychological factors influence a female's participation and success in smoking cessation programs. Three of the physiological reasons impacting females' success at quitting smoking are greater nicotine dependence as compared to males, concerns about weight gain, and hormonal and menstrual influences (Mackey et al., 2008).

Young females are more dependent on nicotine at lower levels of exposure than the general population (Mackey et al., 2008). Also, female smokers use cigarettes as an appetite suppressant to control their weight. Not unexpectedly, quitting smoking generally results in weight gain. A Lung Health Study of 5,887 smokers found that females gained an average of 19 pounds within 1 year after quitting smoking, versus males who gained 17 pounds (O'Neill, 1998). Lastly, hormonal changes associated with the menstrual cycle have been related to increased cigarette cravings, which can negatively impact abstinence from smoking (Schnoll, Patterson & Lerman, 2007).

Three of the psychological reasons to consider affecting young female's success at tobacco cessation are a lower self-rated intention to quit, lower self-esteem, and a

higher incidence of depression and anxiety. Etter, Prokhorov, and Perneger (2002) found that among 2,456 young males and females who were quitting smoking, females had a lower intention to quit and scored lower than males on a self-efficacy scale related to quitting. Secondly, as mentioned earlier, many young females with low self-esteem also have body image dissatisfaction. Smoking cigarettes is a mechanism to manage weight. Lastly, young females who smoke have higher rates of depression and anxiety than males (Croghan et al., 2006).

### **Smoking Cessation and Providers**

Among college students who started to smoke at age 19, 18% have made five or more attempts to quit (Fagan, 2007). A 2007 study of 296 providers at college health centers found that 31% offered individual smoking cessation counseling and 55% offered formal smoking cessation programs (Fagan, 2007). Tobacco cessation advice to college age females by providers can be improved. Females have an increased likelihood of seeking primary care compared to their male peers in their college years (Fortuna, Robbins, & Halterman, 2009). College health clinics should be the nucleus for initiating smoking cessation programs.

Providers are limited in their ability to advocate for patients to quit smoking by lack of reimbursement, staff knowledge deficits, and clinical and administrative priorities (Fagan, 2007). For example, when a provider counsels a patient to quit smoking, third party payors will not reimburse for these services (Fagan, 2007). College health clinic staff also feel their own knowledge about smoking cessation is limited. Thus, they are less confident about advocating cessation strategies (Fagan, 2007). Additionally, current acute medical concerns and charting take precedent over

smoking cessation discussions or follow up with students attempting to quit smoking (Fagan, 2007).

Trust in one's healthcare provider depends on both clinical and interpersonal factors. At minimum, trust in one's provider depends on clinical expertise and continuity in care. In the digital age, patients can search online for a provider who has the clinical expertise they require. To aid in this process, many health systems or clinic websites detail their providers' years of experience, research interests, and location of practice. In a cross-sectional sample of 42,664 persons nationwide, provider continuity was associated with an increase in preventive care, including mammography, influenza vaccinations, and smoking cessation advice (Doescher, Saver, Fiscella, & Franks, 2004).

The provider's communication skills and rapport with patients contribute to overall clinical trust and adherence to recommended interventions. At clinic visits, effective provider communication is both verbal and nonverbal. The patient provider rapport is strengthened when the provider presents clinical issues in "laymen's terms" (Hayes, 2007, p. 424) or answers patients' medical concerns from Internet searching (Hong, 2008). Hayes (2007) surveyed 103 patients seen by APNs about their intention to adhere to their treatment plans. Responses by patients indicated trust and confidence in the APN provider. One patient stated "I feel confident with her and trust her completely" (Hayes, 2007, p. 422). Non-verbal communication such as provider attentiveness to the patient is central to developing a good clinical relationship. One patient seen by an APN stated, "I trust her and she takes all the time I need" (Hayes,

2007, p. 422). This is in contrast to providers who may hurry in and out of a clinic visit, which can be interpreted by the patient as uncaring and disrespectful.

Lastly, empathy from providers lets the patient know the provider is invested in improving the patient's clinical condition. Empathy is defined as "using the patient's perspective as a starting point for care" (DeRosa & Kochurka, 2006, p. 19).

Motivational interviewing, which integrates empathy, self-efficacy, and resolving health discrepancies, has been used successfully to help smokers quit. In comparison to the standard one-time smoking cessation counseling by providers, the use of motivational interviewing on two to three occasions increased patients' quit rates (Harvard Medical School, 2011).

### **Smoking Behavior and Knowledge in College Females**

Morris (2011) examined perceived health risks among college females who were either *current smokers*, *former smokers*, or *never-smokers* to identify gaps in knowledge about smoking-related health conditions. Morris used Survey Monkey to send questionnaires to female students enrolled in MSU, Mankato during Spring, Summer, and Fall of 2011, with the goal of querying college females, ages 18 to 24. Morris received a total of 746 responses. Of those respondents, 264 were excluded as they were either under 18 years old, over the age of 25, or did not provide their age.

Morris (2011) found that college students who were current smokers acknowledged increased health risks associated with smoking. Never-smokers were more likely than current or former smokers to have had a loved one affected by a smoking-related illness. Current smokers were more likely than former or never-smokers to have had a family member smoke. As detailed in prior research, young

females who smoke were more likely to engage in other high-risk behaviors, such as unprotected sexual activity and binge drinking (Ingersoll et al., 2008).

The results of this study are consistent with previous research findings that young females underestimated their current or future risks associated with smoking (Moran, Glazier, & Armstrong, 2003). Morris' (2011) research also identified areas of future research regarding possible trends among current and former smokers and high-risk behaviors. Additionally, Morris identified the need for providers to tailor their educational strategies to adolescent and college females.

### **Summary**

Young females represent an increasing percentage of college students using tobacco. Smoking among college students, ages 18 to 24, is increasing, while smoking among other age groups is decreasing. High-risk behaviors, such as engaging in unprotected intercourse and binge drinking, are associated with tobacco use. Young females' tobacco use and dependence have both physiological and psychological origins. Smoking cessation treatment is less successful among young females than males, with only 5% of female smokers maintaining long-term abstinence from smoking (Orleans, 2007). Patients seen consistently by a provider whom they trust as competent and empathetic can improve the potential for a current smoker to quit smoking.

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **Introduction**

The purpose of this study and secondary data analysis was to assess the relationship between tobacco use among college females and participation in high-risk behaviors, including unprotected intercourse, as well as the concomitant use of oral contraceptives containing estrogen. Additionally, smoking cessation advice presented by primary care providers to current and former smokers is discussed. This chapter describes research design, sample and setting, Morris' original questionnaire, ethical considerations, data collection methodology, and study limitations and strengths.

#### **Design**

The original study, from which the dataset was acquired, was a comparative descriptive study evaluating knowledge assessment of risks associated with college females who smoke, comparing current, former, and never-smokers, and identifying other high-risk behaviors associated with smoking.

The strength of the dataset was that it provided baseline information about young females' engagement with smoking, the medical risks associated with tobacco use, and other high-risk behaviors. Furthermore, this dataset assessed respondents' recollection of provider's dialogue encouraging smoking cessation. A second strength of this study was that participation was voluntary and anonymous, allowing respondents to answer truthfully.

### **Sample and Setting**

The target population was female students enrolled and registered for classes at MSU, Mankato in Spring, Summer, and Fall of 2011. Inclusion criteria was limited to female gender, ages 18 to 24 years old, and an understanding of and ability to read English.

### **Questionnaire**

The questionnaire was adapted from a previously used questionnaire developed by Dr. Moran to evaluate the smoking-related health risks among post-menopausal females (Moran et al., 2003). Morris (2011) added questions about tobacco use, reproductive concerns, infertility, menstrual irregularities, pregnancy, and risks to children. Demographics, including age, race, ethnicity, and family history of smoking, were gathered from respondents. Respondents answered questions regarding health risks using a 3-point scale (Moran et al., 2003): a rating of 1 (*below average risk*), a rating of 2 (*average risk*), to a rating of 3 (*above average risk*). Respondents also answered questions about smoking cessation advice that was offered by providers. The respondents could skip questions should they desire to do so.

### **Ethical Considerations**

The initial study was approved through the MSU-Mankato's Institutional Review Board (IRB). Respondents received a cover letter detailing the reasons for the study and were informed of any possible harm that could result from participation. Replies to the questionnaire from respondents were anonymous. Additionally, respondents were provided with contact information should they have any questions or concerns about the study. Completion and submission of the questionnaire was

considered informed consent for the research to gather and analyze data. The secondary dataset analysis was completed after receiving approval from the MSU, Mankato's IRB.

### **Data Collection**

In the primary study, demographic data such as age and ethnicity were collected. Smoking status was ascertained in response to the following two questions: "Have you ever smoked cigarettes, including cloves?" and "If yes, do you still smoke?" A *yes* response to both questions indicated they were a current smoker; a *yes* response to the first, but not the second question, indicated they were a former smoker. A *no* answer to the first question indicated they were a never-smoker. Subjects were also asked at what age they started smoking, the amount they smoked, if they had received smoking cessation advice from their primary care provider, and if they grew up in a household where there was smoking. The respondents were asked if they had a loved one with a serious health problem associated with smoking. Also, they were asked about their amount and frequency of alcohol use, frequency of unprotected intercourse, and use of oral contraceptives containing estrogen.

Female students were sent an invitation, through campus e-mail, to participate in this study. The questionnaire was accessed via an e-mail link allowing one visit per respondent to avoid duplication. Students had 14 days to complete the questionnaire. A reminder e-mail was sent 7 days after the original e-mail invitation. Among the students sent an invitation, 746 responded to the questionnaire; 273 students were excluded, as they were either under age 18, 25 years or older, or did not indicate their age, yielding a working pool of 472 respondents.

### **Limitations**

One limitation of this study is that it did not represent the current demographics of college students nationwide. In the primary data collection, respondents were 90.9% Caucasian, 3.6% African-American, less than 1% Hispanic, and 4% “other” (Morris, 2011). One reason this dataset had fewer ethnic minorities compared to college campuses nationwide relates to the demographics of southwestern Minnesota. As discussed in Chapter I, MSU, Mankato is located in Blue Earth County, whose population is 92% Caucasian, 2.7% African American, 0.3% Alaska Native/American Indian, 2%, Asian, and 2.5% Hispanic (U.S. Census, 2010). The student population at MSU, Mankato is 89% Caucasian and 11% students of color (*At a glance*, 2012), with slightly more students of color than their neighbors in Blue Earth County.

The percentage of people of color in Blue Earth County falls below that of college students in the United States in 2009. Current statistics of college students in the United States are 62% Caucasian, 14.3% African-American, 12.5% Hispanic, and 4% Asian/Pacific Islander, with the remainder of multiracial heritage (Institute of Education Sciences, 2009).

A further demographic limitation is that the primary data analysis studied only those young female smokers, former smokers, and never-smokers who were enrolled in a four-year college. Every year approximately 3.1 million males and females graduate from high school, but only 2.1 (68%) million males and females attend college (U.S. Department of Labor, 2012). This dataset does not address high school graduates that do not attend college and smoke. Young people without a four-year degree smoke at higher rates than those with college degrees (USDHHS, 2011a).

Another limitation that impacts the interpretation of this data is the subjective responses provided by the respondents to the research question inquiring about smoking cessation advice offered by providers. The respondents may or may not have an accurate memory of whether the provider inquired about their smoking habits.

### **Summary**

The primary study surveyed young college females at MSU, Mankato to gather descriptive data examining the knowledge and health risks associated with college females who smoke; comparing current, former, and never-smokers; and identifying other high-risk behaviors in smokers, including participation in unprotected intercourse and the used of oral contraceptives containing estrogen.

## **CHAPTER IV**

### **RESULTS OF ANALYSIS**

#### **Introduction**

This chapter presents tables and figures from a secondary data analysis of a primary dataset collected by Morris (2011) of 472 respondents that voluntarily and anonymously completed a questionnaire through e-mail about the health effects of smoking. The secondary data analysis generated descriptive results regarding age females start smoking and participation in high-risk activities, including unprotected intercourse and the concomitant use of oral contraceptives containing estrogen. Using descriptive statistics, the receipt of smoking cessation advice from providers to current and former smokers is presented.

#### **Data Analysis**

The primary dataset was comprised of 746 respondents. Of those 746, 264 were excluded, as they were not within the ages of 18 to 24. The remaining 472 comprised the current study's dataset. Among the 472, 342 were current or former smokers. However, 23 of these respondents did not indicate the age they started smoking, or if they had unprotected intercourse and if they used oral contraceptives containing estrogen. This left a dataset of 319 current or former smokers that were used to generate descriptive statistics regarding female smokers and their participation in unprotected intercourse and/or their concomitant use of oral contraceptives containing estrogen.

A critical question relevant to this secondary data analysis is: *At what age did you start smoking?* As shown in Figure 1, a majority 185 (58%) of young females started smoking between the ages of 16 to 19. Among the other respondents, 27 (8%) started smoking between the ages of 12 to 13, 70 (22%) started smoking between the ages of 14 to 15, and 37 (12%) started between the ages of 20 to 24.

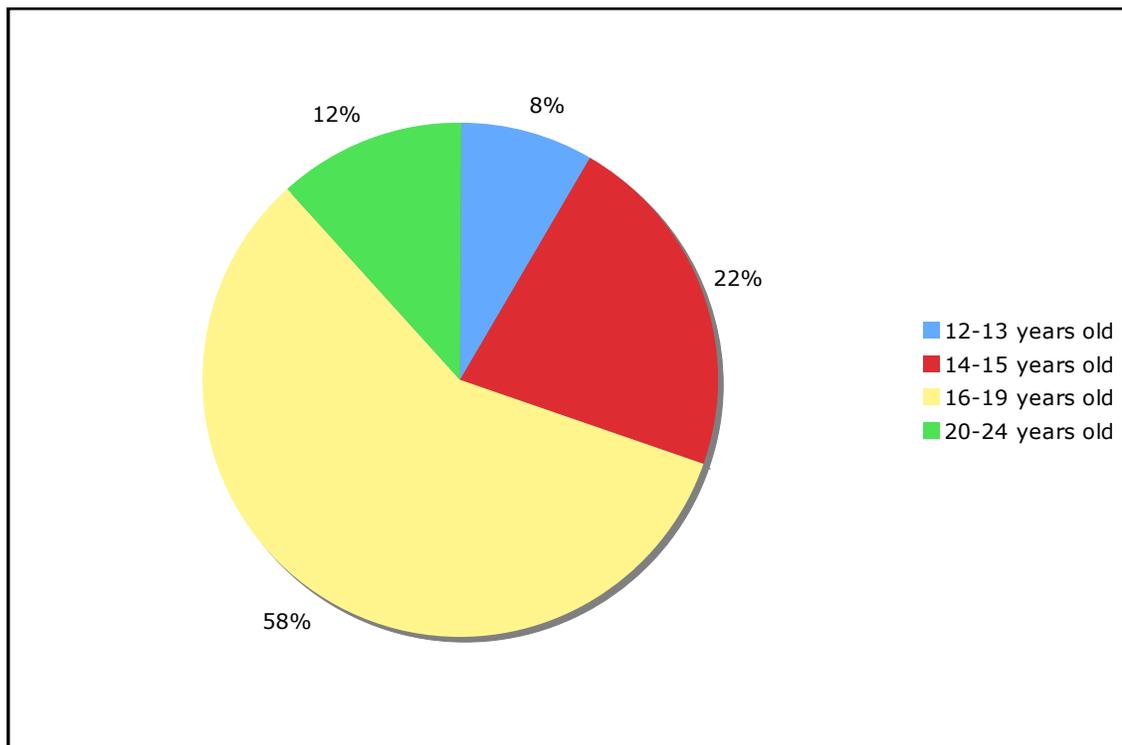


Figure 1. Age of starting smoking among current and former smokers.

### **Age of Starting Smoking and Participation in Unprotected Intercourse**

Of the 319 current or former smokers, 240 (75.2%) respondents participated in unprotected intercourse compared to 79 (24.8%) respondents who did not participate in unprotected intercourse. As shown in Table 1 and Figure 2, of those respondents who started smoking at ages 12 to 13, 20 (6.2%) participated in unprotected intercourse.

Among those respondents who started smoking ages 14 to 15, 59 (18.4%) participated in unprotected intercourse. Of the respondents who started smoking at ages 16 to 19, 135 (42.3%) participated in unprotected intercourse. Among the respondents that started smoking at ages 20 to 24, 26 (8.1%) participated in unprotected intercourse.

This data was also evaluated for significance using Pearson's chi-square at 3 degrees of freedom. The Asymptotic chi-square value was 4.095 ( $p = 0.251$ ). This indicated there was no statistically significant relationship between the age that a college female starts smoking and her participation in unprotected intercourse. The key factor contributing to the lack of statistical significance was that in each age group the majority of the respondents participated in unprotected intercourse. To achieve statistical significance, the majority of one age group must not have participated in unprotected intercourse.

Table 1

*Age of Starting Smoking and Participation in Unprotected Intercourse*

Students Participating In Unprotected Intercourse?	12-13 Years Old	14-15 Years Old	16-19 Years Old	20-24 Years Old	Total Current and Former Smoker
No	7	11	50	11	79
Yes	20	59	135	26	240
Grand Total	27	70	185	37	319

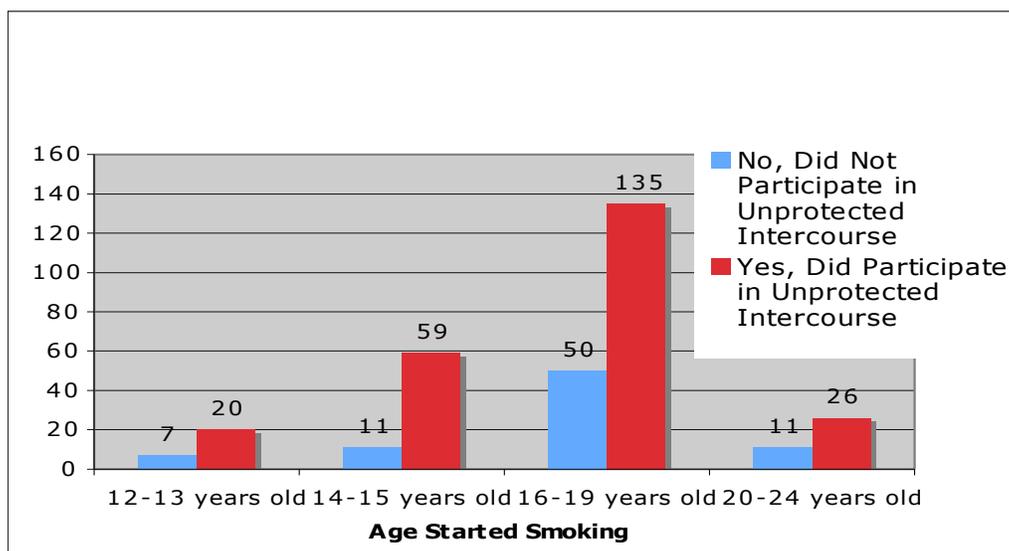


Figure 2. Age of starting smoking and participation in unprotected intercourse.

#### **Age of Starting Smoking and Use of Oral Contraceptives Containing Estrogen**

Of the 319 current or former smokers, 138 of the respondents (43.3%) used oral contraceptives containing estrogen compared to 181 of the respondents (56.7%) who did not use oral contraceptives containing estrogen. Table 2 and Figure 3 show that among those respondents who started smoking at ages 12 to 13, 17 (3.1%) used oral contraceptives containing estrogen. Among the respondents who started smoking at ages 14 to 15, 41 (9.0%) used oral contraceptives containing estrogen. Of the respondents who started smoking at ages 16 to 19, 97 (27.5%) used oral contraceptives containing estrogen. Among the respondents who started smoking at ages 20-24, 26 (3.1%) used oral contraceptives containing estrogen.

Table 2

*Age of Starting Smoking and Use of Oral Contraceptives Containing Estrogen*

Current and Former Smokers and Use of Oral Contraceptives Containing Estrogen	12-13 Years Old	14-15 Years Old	16-19 Years Old	20-24 Years Old	Total
No	17	41	97	26	181
Yes	10	29	88	11	138
Grand Total	27	70	185	37	319

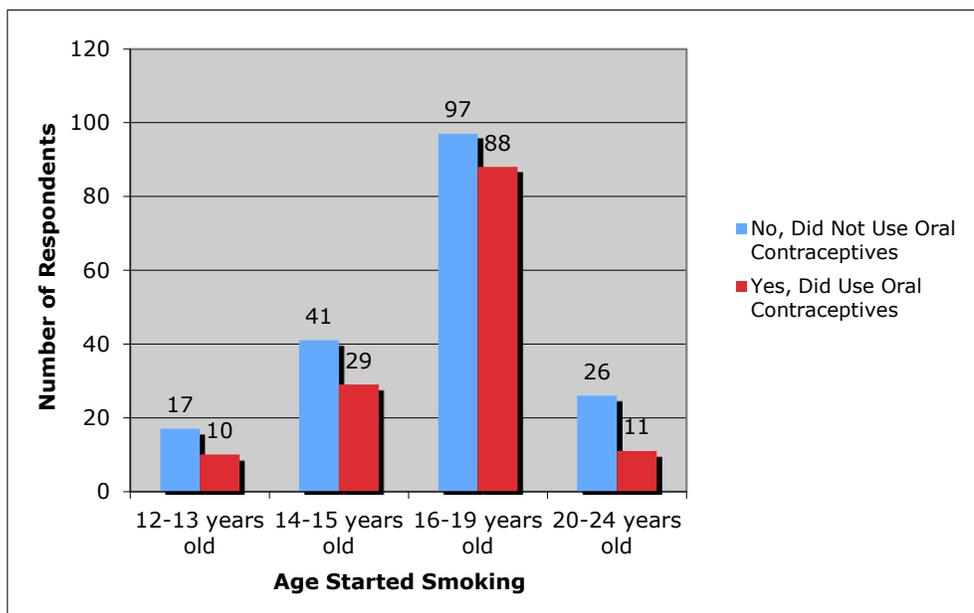


Figure 3. Age of starting smoking and use of oral contraceptives containing estrogen.

This data was evaluated for significance using Pearson's chi-square at 3 degrees of freedom. The Asymptotic chi-square value was 4.680 ( $p = 0.197$ ). This indicated there was no statistically significant relationship between the age that a college female starts smoking and her use of oral contraceptives containing estrogen. A key factor contributing to the lack of statistical significance was that in each age group the majority of respondents did not use oral contraceptives containing estrogen. To achieve statistical significance, one age group must have a majority of respondents using oral contraceptives containing estrogen.

#### **Current and Former Smokers' Receipt of Smoking Cessation Advice**

Among current smokers, 26% received smoking cessation advice, 26% had not received smoking cessation advice, and 48% had not told their provider they smoked. Among former smokers, 29% received smoking cessation advice, 55% had not received smoking cessation advice, and 16% had not told their provider they smoked (Figures 4 and 5).

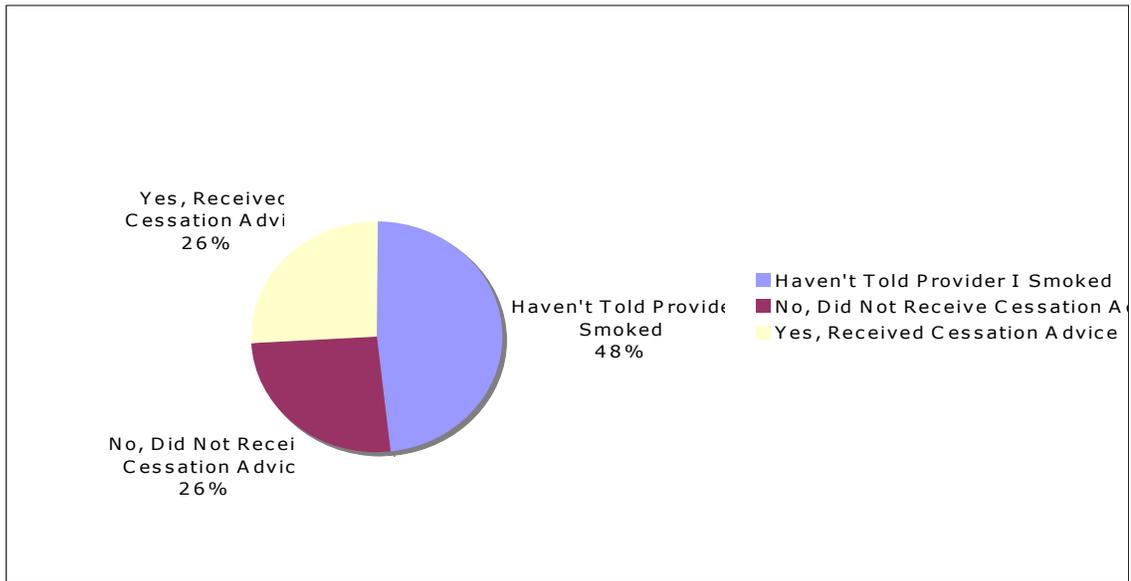


Figure 4. Disclosure of smoking status to providers and receipt of cessation advice – current smokers.

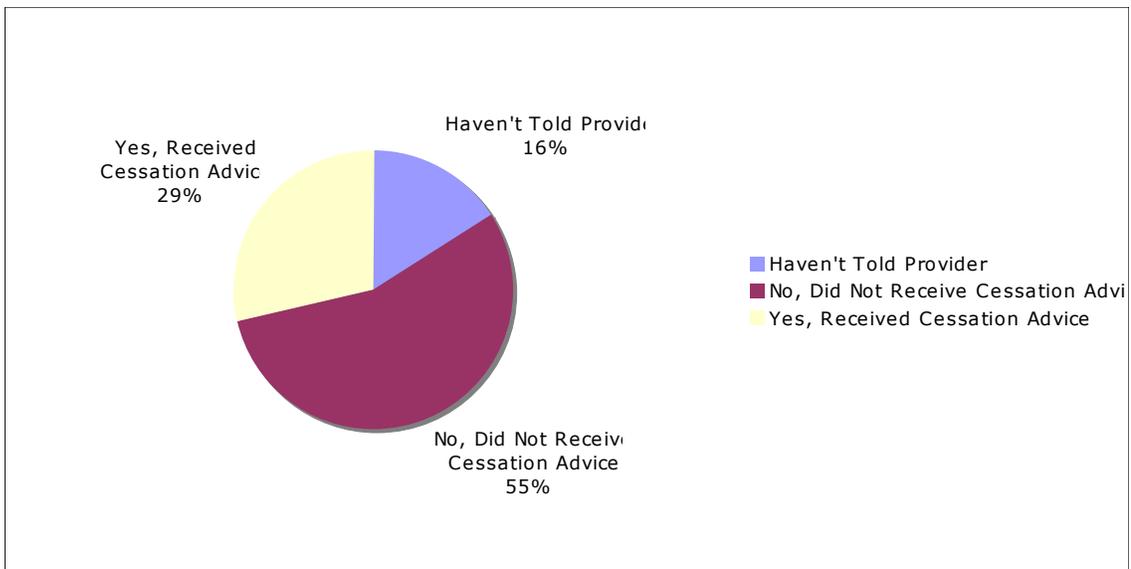


Figure 5. Disclosure of smoking status to providers and receipt of cessation advice – former smokers.

### **Summary**

This secondary data analysis utilized a primary dataset that evaluated college females' knowledge about tobacco use and participation in unprotected intercourse as well as their concomitant use of oral contraceptives containing estrogen. In this secondary data analysis, descriptive statistics show that a majority of college females start smoking between the ages of 14 to 19. Using Pearson's chi-square analysis, there was no statistically significant relationship between onset of smoking among females and participation in unprotected intercourse. Nor is there a statistically significant relationship between onset of smoking among females and use of oral contraceptives containing estrogen. Among current smokers and former smokers, fewer current smokers recall receiving smoking cessation advice from providers than former smokers.

## **CHAPTER V**

### **SUMMARY, DISCUSSION, AND RECOMMENDATIONS**

#### **Introduction**

This discussion is based on a secondary data analysis of a primary dataset from a 2011 survey of 472 college females at MSU, Mankato (Morris, 2011). This study considers if there is a relationship between the age at which young females start smoking and their participation in unprotected intercourse as well as their concomitant use of oral contraceptives containing estrogen. This study also considers how often current and former female smokers receive smoking cessation advice from their providers. Additionally, factors associated with successful smoking cessation are presented, including how providers can influence patients to abstain from smoking or consider cessation. Lastly, potential research topics are presented that derived from conclusions of the secondary data analysis.

#### **Discussion and Conclusions**

Approximately 209 (45%) of the 472 respondents at MSU, Mankato were either current or former smokers. Four key findings are associated with the completion of this secondary data analysis. First, the prevalence of current and former female smokers on campus at MSU, Mankato is above the national average. Second, there is a positive association between onset of smoking at ages 14 to 15 and participation in unprotected intercourse, although this relationship was not statistically significant. Third, a minority of female smokers at MSU, Mankato use oral contraceptives containing estrogen. The

final key finding is that fewer current smokers recall receiving smoking cessation advice than former smokers.

### **Female Smokers at MSU, Mankato**

Among the respondents to this questionnaire at MSU, Mankato, 45% are current or former smokers (Morris, 2011, p. 54). This exceeds the national average of 41.3% among adults ages 18 to 24 (Rigotti et al., 2000). Several factors may explain this statistic.

The first is a national trend of more young females enrolling in college (Doyle, 2010). The gender composition of students enrolled at MSU, Mankato is 53% females and 47% males (*At a glance*, 2012). As discussed in Chapter III, nationally, young females represent 56% of the students enrolled in higher education (Doyle, 2010).

A second reason for the increased prevalence of current and former female smokers at MSU, Mankato compared to the national percentage is related to the demographics of MSU, Mankato students and the predilection of Caucasian college students to be smokers. Rigotti et al. (2000) surveyed a diverse group of 14,000 college students at 114 colleges and found among female smokers, 33% were Caucasians, 22.5% were Hispanic, 19.8% were Asian, 14.7% were African American, and the ethnicity of the remaining 10% of the sample was unknown.

Caucasians predominate among other ethnic groups enrolled in four-year colleges and universities (Institute of Education Sciences, 2009). As discussed in Chapter III, among the students enrolled on MSU, Mankato campus, 89% are Caucasian versus 11% who are students of color (*At a glance*, 2012). The demographics of the primary dataset are consistent with the findings of Rigotti et al. (2000) in that among

current and former female smokers at MSU, Mankato, Caucasians represent the majority of smokers as compared to other ethnic groups. In the dataset used in this secondary data analysis 295 (92.5%) of the respondents were Caucasian; 13 (4.0%) were of mixed ethnicity; 6 (1.8%) were African-American; 4 (1%) were Hispanic; and the ethnicity was not given for the remaining 1 (0.5%) respondent.

Thirdly, this may also be due to the influence of social networks, specifically Greek sororities, on the campus of MSU, Mankato. The presence of pan-Hellenic social groups, such as sororities at MSU, Mankato, could impact and contribute to the University's female students smoking at rates higher than the national average. Although there was no question in the primary data analysis about affiliation with a sorority, one's social network can affect participation in risky behaviors. Scott-Sheldon, Carey, and Carey (2008) surveyed 1585 college students, 255 of whom were Greek members and 1,330 of whom were non-Greek members (p. 64). Greek members had higher rates of alcohol use, binge drinking, and daily cigarette smoking. At least two factors can explain this finding. In an unsupervised, off-campus sorority or fraternity house, there is more personal freedom and greater tolerance of alcohol use and smoking of cigarettes (Scott-Sheldon et al., 2008). Additionally, Greek houses frequently initiate parties and gatherings where alcohol consumption and/or high-risk activities are condoned.

### **Smokers and Participation in Unprotected Intercourse**

Using descriptive statistics, there appears to be a positive association between young females who start smoking at ages 14 to 15 and greater participation in unprotected intercourse as compared to the other age groups. However, using Pearson's

chi-square analysis, there was no statistically significant relationship between the age one starts smoking and participation in unprotected intercourse.

Early onset smoking, defined as starting at ages 12 to 15, can predict an increased incidence of risk-taking behaviors, such as unprotected sexual intercourse (Brook, Ning & Brook, 2006). By the time a female reaches age 18, regardless of smoking status, nearly two-thirds of her high school peers are sexually active (Eaton et al., 2008). The secondary data analysis demonstrated that current and former smokers across all age groups showed a predilection to engage in unprotected intercourse.

### **Smokers and Use of Oral Contraceptives Containing Estrogen**

Among the 319 respondents in this secondary data analysis, 179 (56%) of the current and former smokers did not use oral contraceptives containing estrogen. Lower rates of using oral contraceptives containing estrogen could be due to clinical considerations and personal preference. Providers are unlikely to recommend or prescribe oral contraceptives containing estrogen if certain risk factors are present in a patient. For example, oral contraceptives containing estrogen is contraindicated among females with a history of migraines accompanied by a prodrome or a personal history of breast cancer. Among females, personal preference to avoid the daily dosing required of oral contraceptives may lead patients to consider other forms of contraceptives, such as the vaginal ring or Mirena IUD, which are equally if not more efficacious than oral contraceptives.

### **Current and Former Smokers and Receipt of Cessation Advice**

Among current and former smokers, the respondents' receipt of cessation advice from their providers was lower than expected. Among current smokers, 26% received advice compared to 29% of former smokers. Among college students nationwide, 32% to 38% receive smoking cessation advice from their providers (Browning, Ferketich, Salsberry, & Wewers, 2008; Ferketich, Khan, & Wewers, 2006). Unfortunately, the dispensation of cessation advice from providers can depend on several factors, including provider intervention and/or lack of financial reimbursement by payors.

A *Healthy People 2020* goal for smoking cessation is that 80% of patients receive cessation advice and/or directed interventions from their providers to encourage them to quit smoking (Ferketich et al., 2006). Smokers age 24 or younger are less likely to receive smoking cessation advice than their older cohorts (Curry et al., 2007). Among the multiple morbidities associated with tobacco use, smoking insults one's respiratory system, causing the potential for frequent bronchial infections and/or an exacerbation of an asthmatic condition. Furthermore, without smoking cessation strategies directed to the college smoker, their risk of developing cancer and heart disease increases with every year she or he smokes (ALA, 2011).

Lack of reimbursement is another reason providers may not offer tobacco cessation advice at rates that approach the national average. In Minnesota, the majority of college students do not fit into the insurance categories that reimburse smoking cessation counseling. Currently, Minnesota covers cessation services for Medicaid recipients and state employees (ALA, 2011). Several states (Colorado, Illinois, Maryland, New Jersey, New Mexico, North Dakota, Oregon, Rhode Island and

Vermont) mandate that private insurance and state-sponsored insurance cover smoking cessation services (ALA, 2011). At many colleges and universities campus-wide bans of all tobacco products exist to decrease the prevalence of students smoking. MSU, Mankato instituted a campus-wide ban eliminating “smoking, tobacco use, and tobacco sale effective January 1, 2012” (*Tobacco free*, 2011).

### **Predictive Factors Favoring Successful Smoking Cessation**

Among young females who attempt to quit smoking, three factors are associated with sustained abstinence from tobacco: a tolerance for risky health-related behaviors, educational preparation, and lifestyle. The first factor is philosophical in nature and is based on *risk-tolerance* (Goto, Takahashi, Nishimura, & Ida, 2009) of the individual. Risk-tolerance is defined at either a low or high level, as determined by a survey presented to individuals who had recently quit smoking (Goto et al., 2009). A low level of risk-tolerance in a former smoker is defined as a person who places more weight in the potential health risks associated with smoking. Conversely, a high level of risk-tolerance among a former smoker is defined as a person who places less value in the health-risks associated with smoking. Goto et al. found that a high level of risk-tolerance among the participants was associated with a desire for short-term gratification and relapse into their smoking habit (2009).

A second factor associated with successful efforts to quit smoking pertains to one’s educational background and health habits. In a 2011 United States Department of Health and Human Services study, 53% of female respondents attempted to quit smoking (2011b). The female smokers with a GED or less than a high school degree had lower rates of successful cessation than women with some college or a Bachelor’s

degree. Furthermore, female smokers without a high school degree or a GED were less likely to quit than those females with either an Associate's, some college, a Bachelor's degree, or a graduate degree (McDermott, Dobson, & Owen, 2008). Regardless of one's educational preparation, 40% of each group wanted and intended to quit in the next 30 days (Green et al., 2007).

In the young adult years, from ages 18 to 24, one's health habits can change when relationships form, marriages occur, and children are born. Successful smoking cessation among young females was associated with parenthood, lower rates of alcohol use and depression, and increased physical activity (McDermott et al., 2008). One can infer from this evidence that parenthood can reduce a tendency toward high-risk behaviors, including unprotected intercourse or alcohol use, that are associated with smoking. One can also infer that starting a family can positively influence one's emotional and physical health, including through increasing physical activity associated with following a toddler or infant around the house. However, there is no evidence linking smoking cessation and explicit reduction in unprotected intercourse. Similarly, there is no evidence linking smoking cessation with either increased or decreased use of oral contraceptives containing estrogen.

### **Implications for Practice**

The steady increase in the number of college female that smoke will impact clinical practice and interventions by providers. Our secondary data analysis demonstrates that among current and former female smokers, the majority were between the ages of 14 to 19. Among the 319 current and former smokers, 70 (22%) started at age 14 to 15 and 185 (58%) started smoking between ages 16 to 19. This data

is consistent with current research showing that the population group at highest risk for smoking is female adolescents, ages 14 to 19 (Eaton et al., 2008). Incorporating this information, providers can inquire of female patients regarding peer pressure or family influences to begin smoking, thus detecting their patient's risk factors to start smoking or assessing whether they are ready to quit smoking.

In order to affect change as provider, it is important to assess a patient's risk factors and family influences affecting a young female's decision to start, quit, or abstain from smoking. It is essential to consider that one's family and/or peer groups can be a "pro-smoking" influence increasing the risk for tobacco dependency (Orlando et al., 2004). Family relationships can condone smoking by allowing cigarette smoking in the home. Children raised in smoking households are likely to become smokers (Harakeh, Scholte, deVries, & Engels, 2005). Peers also have an influence on starting smoking; among young people who smoke, a majority of their peers smoked versus peers that did not smoke (VanVolkum, 2008). The relationship and rapport between a provider and patient is essential in the teenage years to impart healthy lifestyle choices, such as not engaging in high-risk activities including smoking, unprotected sexual intercourse, and binge drinking (Schwartz et al., 2010).

### **Implications for Research**

Based upon the conclusions of this secondary data analysis, there are two potential research proposals that can reduce a young person's tendency to start smoking and improve patient provider communication about current smoking status. The first research proposal is to initiate a health and wellness seminar for college students that discusses high-risk behaviors associated with smoking. A second research proposal

utilizes a questionnaire tailored to the variable nature of college students' smoking habits.

The first research proposal involves a prospective study evaluating if participation in a health and wellness seminar for first-year college students would affect one's decision to start smoking or to abstain from smoking. The themes of this seminar would review high-risk behaviors such as binge drinking, marijuana use, and unprotected intercourse and their association with cigarette smoking (Rigotti et al., 2000, p. 704). Students would be followed throughout their college years to note if they abstained from smoking, started smoking, or quit smoking.

The second research proposal addresses the limited disclosure by patients to providers about their current smoking status. This research proposal incorporates results of this secondary analysis which found 48% of current smokers and 16% of former smokers did not disclose to their provider that they were current smokers. A questionnaire would be filled out by patients prior to their clinic visit and would address two concerns associated with smoking among college students. The questionnaire would likely reduce the limited self-disclosure to providers about smoking status and would quantify varying levels of cigarette smoking addiction among college students.

Using this tool would allow the student the option to volunteer their smoking history without having to admit *face-to-face* to the provider that they smoked. Smokers may be embarrassed of their habits and feel ashamed and do not want to experience any judgment from their provider about their smoking habits. Secondly, this tool would consider the variable nature of smoking habits of college students, quantifying if they

were: social smokers, who smoke only at parties; closet smokers, who smoke only at home and alone; and/or current smokers.

### **Uniqueness of this Secondary Data Analysis**

The unique goal of this secondary data analysis was to determine if there was a relationship between the age college females started smoking and participation in unprotected sexual intercourse as well as the concomitant use of oral contraceptives containing estrogen. In the primary data analysis, Morris' (2011) study considered the health risks associated with smoking. However, she did not evaluate the high-risk activities associated with young college female smokers. Another unique aspect to this discussion not covered by Morris is the role of the provider in delivering smoking cessation advice.

### **Summary**

Increasing rates of young females smoking on college campuses is a public health concern. A majority of females start smoking between ages 14 to 19. College females who started smoking at ages 14 to 15 showed a greater predilection for engaging in unprotected intercourse than the other age groups. However, there was no statistically significant relationship between the age young females started smoking and (a) their participation in unprotected intercourse or (b) their concomitant use of oral contraceptives containing estrogen. Smoking cessation advice by providers in this study was slightly more prevalent among current smokers than former smokers. This may indicate that providers at college health clinics are targeting their discussions to female smokers in a desire to improve rates of smoking cessation. This modest increase

in the delivery of cessation advice is of immeasurable value to the health of current female smokers as well as the public health of the community.

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**APPENDIX A**  
**DATA COLLECTION TOOL (Morris, 2011)**

### Perceived Health Risks of Smoking Assessment Tool

1. What is your age?
  - a. Under 18
  - b. 18
  - c. 19
  - d. 20
  - e. 21
  - f. 22
  - g. 23
  - h. 24
  - i. 25 or older
  
2. What is your ethnicity?
  - a. Caucasian/white
  - b. African America/Black
  - c. Hispanic
  - d. Other
  
3. Have you ever smoked (cigarettes, cloves, cigars, or tobacco pipe)?
  - a. Yes
  - b. No
  
4. If yes, do you still smoke?
  - a. Yes
  - b. No
  
5. At what age did you first start smoking?
  - a. 12-14 years old
  - b. 15-18 years old
  - c. 19-21 years old
  - d. 22-24 years old
  
6. If you are a current smoker, how many cigarettes/tobacco products do you smoke per day?
  - a. Less than 10
  - b. 10-20
  - c. 21-39
  - d. 40 or more
  
7. Have you ever received smoking cessation advice from your health care provider?
  - a. Yes
  - b. No
  - c. I haven't told my provider that I smoke
  - d. N/A

8. Did you grow up with a family member who smoked?
  - a. Yes
  - b. No
  
9. Do/Did you have a family member who suffered a serious health consequence related to smoking?
  - a. Yes
  - b. No
  
10. Do you use oral contraceptive pills that contain estrogen?
  - a. Yes
  - b. No
  
11. Have you ever engaged in unprotected intercourse/sex without condoms?
  - a. Yes
  - b. No
  
12. Have been diagnosed with HPV (human papilloma virus) infection or had an abnormal pap smear?
  - a. Yes - HPV infection only
  - b. Yes - abnormal Pap smear only
  - c. Yes - both HPV and abnormal Pap
  - d. No - neither
  - e. I have never been tested or had a pap smear done
  
13. How many alcoholic beverages do you drink at one time?
  - a. 1-2
  - b. 3-4
  - c. 5 or more
  - d. I do not drink alcohol
  
14. How many alcoholic beverages do you drink per week?
  - a. 1-7
  - b. 7-14
  - c. 15-21
  - d. More than 21 drinks a week
  - e. I do not drink alcohol
  
15. Please identify the first most common health risk related to smoking.
  - a. Osteoporosis
  - b. Lung Cancer
  - c. Heart Disease/Heart Attack

16. Please identify the second most common health risk related to smoking.
- Heart Disease/Heart Attack
  - Osteoporosis
  - Lung Cancer
17. Please Identify the third most common health risk related to smoking.
- Lung Cancer
  - Heart Disease/Heart Attack
  - Osteoporosis
18. Please rate what you think your lifetime risk of getting the following health conditions is using the following scale:
- |                      |                                    |
|----------------------|------------------------------------|
| 1-below average risk | 3-average risk                     |
| 2-average risk       | 4-already diagnosed with condition |
- Heart Disease/Heart Attack
  - Stroke
  - Lung Cancer
  - Oral Cancer (Mouth, Larynx, Pharynx)
  - Esophageal Cancer
  - Breast Cancer
  - Stomach Cancer
  - Pancreatic Cancer
  - Colon/Rectal Cancer
  - Kidney Cancer
  - Bladder Cancer
  - Cervical Cancer
  - Vulvar Cancer
  - Asthma
  - Bronchitis
  - Emphysema
  - COPD (Chronic Obstructive Pulmonary Disease)
  - Osteoporosis
  - Painful periods (Dysmenorrhea)
  - Lack of periods (Amenorrhea)
  - Irregular Menstrual Cycles
  - Early Menopause
  - Delayed conception
  - Infertility

19. Please rate what you think your lifetime risk of getting the following health conditions is if smoking during pregnancy using the following scale:
- |                      |                                    |
|----------------------|------------------------------------|
| 1-below average risk | 3-above average risk               |
| 2-average risk       | 4-already diagnosed with condition |
- a. Pregnancy complications (ectopic pregnancy or early miscarriage)
  - b. Having a baby with low birth weight
  - c. Going into premature labor
  - d. Prenatal Death (death of baby before birth, 2nd, or 3rd trimester loss)
  - e. Infant Death (SIDS)