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Treatment Interventions for Tobacco Cessation at an Inpatient Mental Health Facility

Stephanie Marie Stansell
Walden University

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Stephanie Marie Stansell

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Walden University
2020

Abstract

Treatment Interventions for Tobacco Cessation at an Inpatient Mental Health Facility

by

Stephanie Marie Stansell

MPH, American Military University, 2011

BS, East Carolina University, 1997

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2020

Abstract

Tobacco use is the leading cause of preventable death and disease in the United States. According to the Centers for Disease Control and Prevention, 36.5% of adults with any mental illness use tobacco compared to 25.3% of adults without a mental illness; however, there are limited data to determine the best approaches for tobacco cessation among the mentally ill. The purpose of this quantitative, quasi-experimental study was to investigate the differences among 1-on-1 counseling versus group counseling in tobacco cessation rates among psychiatric patients aged 18 years old and older who were identified as a tobacco user upon admission to a local inpatient mental health facility during December 2016 to November 2017, as well as whether the type of counseling affects the receipt of Nicotine Replacement Treatment (NRT) by this population group. The social ecological model guided this study. Descriptive statistics, chi-square, and binomial logistic regression were used to address the research questions. The results revealed that cessation rates were higher within the group sessions when compared to 1-on-1 counseling ($OR = 2.326$, $95\% CI: 1.17-4.633$). Patients who were part of the group counseling sessions were less probable to receive NRT compared to those individuals that were in 1-to-1 counseling ($OR = 1.173$, $CI 95\%: .718-1.917$). The implications for positive social change include educating all physicians, nurses, and staff and leading efforts to reduce tobacco use within the mentally ill population receiving care at the local inpatient mental health facility, which could result in the reduction of overall tobacco users within the mentally ill population.

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Dedication

I would like to dedicate this to my daughter, Gracie. You have always been supportive of my schooling and my biggest cheerleader, I love you. I hope I have set an example for you to follow and know that I am always going to be your cheerleader! To my parents, thank you for all of your unwavering support and counseling through this process. There were many times I wanted to quit and you both reassured me this is the right thing to do, I love you both. To my friends that have supported me and cheered me on, thank you.

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Chapter 1: Introduction to the Study

Tobacco use is the leading cause of preventable death and disease in the United States (Centers for Disease Control and Prevention [CDC], 2017). Every year more than 480,000 people die prematurely due to their tobacco use (CDC, 2017a; Prochaska et al., 2017). Not only is there the loss of life associated with tobacco use, but there is also the loss of productivity and tremendous healthcare costs estimated at over \$300 billion each year (CDC, 2017a; Prochaska et al., 2017).

When compared to the general population, people with mental illness are disproportionately affected by tobacco use (CDC, 2013b). According to the CDC (2013b), 36.5% of adults with any mental illness use tobacco compared to 25.3% of adults without a mental illness (p. 2). This particular group of people die 5 years earlier than individuals without any mental illness (CDC, 2013b). Research has shown individuals with a mental illness are likely to live below the poverty line as well as lack access to healthcare and help quitting tobacco use (CDC, 2017; Prochaska et al., 2017).

In the current literature, there is little information available that shows a reduction in smoking rates when a patient is provided individual tobacco cessation counseling by a certified tobacco treatment specialist (CTTS). Research is limited to medical providers, such as medical doctors, physician assistants, and registered nurses (Patnode et al., 2015; Ralston et al., 2013; Selby et al., 2010). In this study, I aimed to show the positive benefit to 1 on 1 counseling versus group counseling for mentally ill patients conducted by a CTTS while admitted to an inpatient psychiatric hospital. Because education, counseling, and medication management are provided, this research has the opportunity to change the

way mentally ill tobacco users are treated and help change policies that directly impact their care.

In this chapter, I discuss background information on mental illness and factors that affect tobacco cessation. Further examination of the problem, purpose, nature, and research questions of the study are provided. The theoretical foundation, definitions, limitations, and study significance are also be addressed.

Background of the Study

Over the past 50 years, the numbers of smokers in the United States has finally decreased overall (CDC, 2017). Even though overall smoking rates have successfully decreased, there is a group within the United States that is still experiencing disproportionately high numbers of smokers--those that have mental illness (CDC, 2013a; Prochaska et al., 2017; Ziedonis et al., 2008).

Based on the literature, there are many reasons for this (Prochaska et al., 2017). One of the reasons that was explored is the self-medication theory (CDC, 2013; Morisano et al., 2009; Prochaska et al., 2017). The Clinical Practice Guidelines for Treating Tobacco Use and Dependence (2008) sets that standard for how professionals should treat all patients, and one of the most effective methods of treatment is to provide dual therapy that includes counseling and nicotine replacement therapy (NRT) from qualified individuals.

Currently, the gap in knowledge in the field shows there are few facilities that follow the Clinical Practice Guidelines for treating tobacco use and dependence and the current recommendations from the American College of Cardiology (Barua et al., 2018;

Services, 2008). In this research study, I aimed to address the gap in knowledge and show the success of implementing one-on-one counseling and NRT by a CTTS. This study was needed because it has the potential to show a successful one-on-one tobacco cessation counseling program can be implemented to help reduce the number of mentally ill smokers and tobacco users at an inpatient psychiatric hospital. Many years of research have shown individuals that quit smoking have less readmissions, shorter hospital stays, reduction of depression and anxiety, improved mood, and better quality of life (Barua et al., 2018; Taylor et al., 2014).

Problem Statement

The goal of this correlational research project was to measure the impact of one-on-one tobacco cessation counseling versus group counseling at an inpatient psychiatric hospital located in South Carolina. According to the National Alliance on Mental Health (NAMI; 2017), 44.3% of all cigarettes consumed are consumed by individuals that have a form of mental illness and/or a substance abuse (p. 1). Since the first *Smoking and Health: Report of the Advisory Committee of the Surgeon General of the Public Health Service* in 1964 much progress has been made in decreasing the numbers of people that use tobacco (Department of Health and Human Services [DHHS], 2014). There has been a steady decline in adult smokers from 42.4% in 1964 to 18% in 2012, which is a 58% drop (Campaign for Tobacco Free Kids, 2020). Although significant achievements have been made there is much work to be done. As aforementioned, even though the current adult smoking rate is 18%, 44% of those are dealing with a mental illness and/or a substance abuse problem (NAMI, 2017).

Research shows smoking is a known cause of lung and other cancers, heart disease, stroke, and lung diseases (Barua et al., 2018; Taylor et al., 2014). In addition to the negative health effects of smoking, research shows smoking can interfere with second generation, atypical, antipsychotic medications (Kennedy et al., 2013). Some second generation, atypical, antipsychotic medications are known to have a higher risk of heart disease, and the added risk factor of smoking can make treating the mentally ill patient difficult and with added unnecessary risk (Kennedy et al., 2013). Smoking while taking these medications also interferes with absorption of the medication, making regulating patients' medication another added challenge (Kennedy et al., 2013).

Purpose of the Study

The purpose of this correlational study was to explain the potential effect of changing from group-based tobacco education to one-on-one, individual tobacco cessation counseling and how this method of counseling had a higher reach to help reduce the prevalence of tobacco use in the mentally ill population at inpatient psychiatric hospital in South Carolina.

Research Questions and Hypotheses

The study site hospital uses a communication platform called Telask to maintain a database of all patients that are diagnosed as tobacco users upon admission. All admitted patients have their tobacco status documented in their electronic medical record (EMR). Telask, the company that houses the data, provides automated phone calls to all identified patients to inquire about their smoking status.

The research questions and hypotheses that guided this study are as follows:

Research Question 1: To what extent does the type of intervention (i.e., one-on-one versus group counseling) affect tobacco cessation status (i.e., quit or smoking) while controlling for age, gender, and years of smoking.

H_01 : One-on-one counseling will result in a higher proportion of participants who quit smoking (as compared to group).

H_{a1} : Group counseling will result in a higher proportion of participants who quit smoking (as compared to one-on-one).

Research Question 2: To what extent does type of counseling (i.e., one-on-one versus group counseling) affect patient's receipt of NRT while inpatient (i.e., any NRT medications vs no NRT medications) and controlling for age, gender, and years of smoking.

H_02 : One-on-one counseling will result in a higher proportion of patients receiving NRT (as compared to group).

H_{a2} : Group counseling will result in a higher proportion of patients receiving NRT (as compared to 1 on 1).

The variables studied were: (a) independent: type of intervention (i.e., one-on-one vs group); (b) dependent: smoking status (i.e., quit versus smoking); (c) dependent: the number of patients that received any NRT vs no NRT; and (d) control variables: age, gender, and years of smoking. The variables were studied for the time period of 6 months prior to implementation of the one-on-one sessions (i.e., December 2016 to May 2017) and 6 months postimplementation (June 2017 to November 2017).

Theoretical Foundation

For this study, I used the social ecological model (SEM) as the theoretical foundation. Bronfenbrenner (1977) wrote that SEM is a theory that explains that human development occurs through complex interactions within a person's immediate environment (Golden & Earp, 2012; Kilanowski, 2017). According to the SEM, an individual's environment is a crucial element in behavior development and behaviors result from influences on multiple levels (Bronfenbrenner, 1977; King et al., 2018). King et al. (2018) described the five levels of influence as: (a) intrapersonal/individual, (b) interpersonal, (c) organizational, (d) community, and (e) public policy (p. 1292). Intrapersonal/individual level factors are those individual characteristics that influence behavior (e.g., personal beliefs, attitudes, knowledge, and skills) (Kilanowski, 2017; King et al., 2018). Interpersonal factors that influence behavior change are social groups that a person identifies with (e.g., family, friends, and peer groups) (Kilanowski, 2017; King et al., 2018). Organizational level factors are a network of influencers that promote or constrain behaviors, including schools, churches, neighborhoods, and work; these influences can be positive or negative (Kilanowski, 2017). The next level of influence is the community level, which includes a much broader scope of social networks, such as social and cultural norms (King et al., 2018). Public policy is the last level in behavioral influence and includes any laws, regulations, formal and informal rules, and understandings that are adopted to guide individual behavior (Kilanowski, 2017; King et al., 2018).

The SEM has been useful in explaining and influencing behavior change, not just understanding behavior development (Kilanowski, 2017) . The specific SEM constructs of intrapersonal and organizational were the focus of this study. I chose these constructs because of the knowledge obtained in one-on-one counseling influences the other levels of the individual's environment and helps to change their behavior of tobacco use, which was tested in Research Question 1. On the organizational level, there are policies in place that do not allow smoking or any tobacco use in the study site facility, and because of that policy, NRT is offered to each patient; research has shown that counseling paired with NRT increases cessation rates, and this was tested in Research Question 2 (King et al., 2018; Prochaska et al., 2017).

Nature of the Study

The rationale for this quasi-experimental study was to compare the variables during specified time periods: December 2016 through May 2017 and June 2017 through November 2017. As aforementioned, the independent variable was type of intervention (i.e., 1 on 1 versus group) counseling. The dependent variables were (a) number of individuals not smoking at 30 days postdischarge and (b) the number of discharged patients reached by Telask at 180 days.

The participants in this study were all psychiatric patients age 18 years old and older that were identified as a tobacco user upon their admission to the study site. Their tobacco use status is updated in the EMR, then sent to the Telask system for the CTTS to generate a list to work from. All data were collected through the CTTS and EMR, then

uploaded to Telask. As previously mentioned, I requested and received the data from Telask for the aforementioned time points for analysis.

I conducted data analysis through Statistical Package for the Social Sciences, a software package designed for statistical analysis (IBM, 2018). Data sets being analyzed were December 2016 to May 2017 (i.e., group sessions) and June 2017 to November 2017 (i.e., individual sessions). These data were analyzed by using descriptive statistics and multiple logistic regression (Creswell, 2009).

Definition of Terms

Cessation status: The success or failure of smoking cessation intervention .(NCI Dictionary of Cancer Terms, 2011)

Group counseling: Tobacco cessation counseling in a group format (*Tobacco Treatment Program*, n.d.).

Nicotine replacement therapy (NRT): Nicotine patches, gum, and/or lozenges(NCI Dictionary of Cancer Terms, 2011)

Nitrosamines: Tobacco-specific nitrosamines are a group of carcinogens that are present in tobacco and tobacco smoke. They are formed from nicotine and related tobacco alkaloids (Food and Drug Administration [FDA], 2018).

One-on-one intervention: Counseling session with the CTTS and patient (*Tobacco Treatment Program*, n.d.).

Pack year: A way to measure the amount a person has smoked over a long period of time. It is calculated by multiplying the number of packs of cigarettes smoked per day by the number of years the person has smoked. For example, 1 pack year is equal to

smoking one pack per day for 1 year, or two packs per day for half a year, and so on (“Pack year,” n.d.).

Patients counseled: The number of patients that had a counseling session with the CTTS (*Tobacco Treatment Program*, n.d.).

Polycyclic aromatic hydrocarbons: A class of compounds composed of two or more fused benzenoid rings known for their carcinogenic and mutagenic properties (Va et al., 2015).

Reach rate: The number of patients that answered their phone when they received a call from Telask (*Tobacco Treatment Program*, n.d.).

Smoking cessation rates: The number of people that have quit smoking 30 days postdischarge (CDC, 2019)

Assumptions

I made five assumptions in this study:

1. One-on-one counseling is appropriate for each patient.
2. The EMR accurately indicates the patient’s tobacco use status.
3. All patients want 1 on 1 counseling.
4. There were statistical differences between the 1 on 1 and group sessions.
5. The use of multiple logistic regression showed a relationship between the variables.

Scope and Delimitations

In the United States, 36% of adults with a mental illness smoke cigarettes when compared to 21% of adults who do not have a diagnosed mental illness that smoke (CDC,

2013). According to the CDC (2017), in 2009 South Carolina spent \$1.9 billion on healthcare costs due to smoking. Not only are there higher healthcare costs associated with smoking, but individuals with mental illness are at a higher risk for nicotine addiction, providers encouraging the self-medication hypothesis, and worse treatment outcomes (CDC, 2013; Morisano et al., 2009; Prochaska et al., 2017).

The inclusion criteria for this study were that all individuals that were admitted to the study site and had been identified as a tobacco user over the age of 18 years old. Exclusion criteria were all patients not admitted to the study site and any individuals under the age of 18 years old.

The boundaries of this study were limited to individuals counseled; competency of the CTTS; healthcare access; availability of the smoking cessation program (i.e. Monday through Friday only); NRT; and cultural bias, which may be difficult to achieve through a quantitative study alone.

Limitations

I identified the following limitations concerning this study:

1. All patients were offered counseling and NRT but not all participated.
2. Counseling efforts were not as successful due to the patient's refusal for counseling.
3. Not all patients may have been offered NRT.
4. The absence of randomization to a particular group could have led to nonequal test groups that limited the generalizability of results.

5. The lack of randomization may have led to a statistical analysis that was not as meaningful and posed threats to internal validity.
6. As with any study, human error could have also played a role in validity

Significance of the Study

The significance of this study lies in the ability of the findings to be used to bring about change in how people with mental illness are counseled and treated for their tobacco addiction. This population's smoking rates are disproportionate when compared to the overall population. As explained by Prochaska et al. (2017), mentally ill smokers account for 200,000 of the 520,000 of tobacco-related deaths in the United States, and they die up to 25 years earlier when compared to individuals without any mental health issues.

The implementation of 1 on 1 counseling has brought significant positive social change to the hospital study site. With the implementation of 1 on 1 counseling, the study site has changed the treatment process for their psychiatric patients. Since implementation, each patient is identified, counseled, and given NRT to help them quit smoking and have better treatment outcomes. The significance to social change is this marginalized patient population now has the same tobacco cessation treatment as the nonmarginalized population. With access to more thorough and consistent tobacco cessation services, this group will have better inpatient treatment and health outcomes. The findings of this study can be used to help improve the treatment process at the local facility and throughout the state for all with mental illness.

Summary and Transition

Smoking rates in the United States have been on the decline for the overall population; however, the mentally ill population is one group that has much higher smoking rates than the overall population. There has been a steady decline in adult smokers from 42.4% in 1964 to 18% in 2012, which is a 58% drop (Campaign for Tobacco Free Kids, 2014). Although significant achievements have been made there is much work to be done. Even though the current adult smoking rate is 18%, the rate of those are dealing with a mental illness and/or a substance abuse problem that smokes is 44% (NAMI, 2017). With such a high rate of smokers in the mentally ill population, programs need to be developed to help reduce this group's overall smoking rate. Current literature shows the mentally ill population suffers the most tobacco-related illnesses, and they are not offered cessation treatment like individuals that are not dealing with a mental illness (Prochaska et al., 2017). In Chapter 2, I will discuss the literature related to the burden of smoking on the state of South Carolina, the health hazards of smoking, the theoretical foundation, and the clinical practice guidelines (CPG).

Chapter 2: Literature Review

Tobacco use is the Number 1 cause of preventable death in the United States (Campaign for Tobacco Free Kids, 2020; CDC, 2013). Each year over 520,000 United States citizens die because of their tobacco use (Campaign for Tobacco Free Kids, 2020; CDC, 2013; Prochaska et al., 2017). Since the first *Smoking and Health: Report of the Advisory Committee of the Surgeon General of the Public Health Service* in 1964, much progress has been made in decreasing the numbers of people that use tobacco (DHHS, 2016). There has been a steady decline in adult smokers from 42.4% in 1964 to 18% in 2012, which is a 58% drop (Campaign for Tobacco Free Kids, 2020). Although significant achievements have been made there is considerable work to be done. It is important for all smokers to quit, but one subpopulation has disproportionately higher levels of smokers: those individuals with a mental illness and/or substance use disorder (CDC, 2013; Le Cook, 2014; Peckham et al., 2017).

According to the CDC (2016), approximately 36% of adults with a mental illness smoke compared to 21% of adults with no mental illness (p. 4). Mentally ill smokers account for 200,000 of the 520,000 of tobacco-related deaths, and they die up to 25 years earlier when compared to individuals without any mental health issues (Prochaska et al., 2017).

People with mental illness are disproportionately affected with high smoking prevalence when compared to the general population (Prochaska et al., 2017). The overall tobacco use rate in South Carolina, based on information from the SC Behavioral Risk Factor Surveillance system, is 23.1%, which is slightly higher than the national average

of 18% (Nguyen, 2016). That number increases to 27% when tobacco users are dealing with a mental illness (CDC, 2013). The purpose of this research study was to show the higher numbers of patients reached for tobacco cessation while at an inpatient psychiatric hospital that is transitioning from group education sessions to 1 on 1 counseling sessions with a CTTS. In this chapter, I explain South Carolina's tobacco history, the top health-related consequences related to tobacco use, the CPGs for treating tobacco dependence, and tobacco cessation as it relates to the SEM.

Literature Search Strategy

For this literature review, I searched the following online databases for peer reviewed articles that pertained to the topic of tobacco cessation: Pubmed, ProQuest, Google Scholar, Medline, Ebsco, and Cochrane Collaboration. The key search terms used were *tobacco cessation*, *mental illness*, *cessation interventions*, and *self-medication hypothesis*. Inclusion criteria were English language articles that were published in the previous five years, but I also included some literature published more than five years ago due to the lack of current literature on the specific topic. Exclusion criteria were literature that was not peer reviewed and any literature that was not related to tobacco use, mental health, and addiction.

In this chapter, I cover the history of tobacco in South Carolina, mental illness, and the prevalence of tobacco use among those effected by mental illness. In South Carolina, 20.4% of the population has a diagnosis of a serious mental illness (SMI) and of that subpopulation, 36.7% smoke cigarettes in comparison 36.1 % of the U.S. population diagnosed with an SMI that smoke cigarettes; there is not much difference

between the smoking rates of this subpopulation in South Carolina and the United States (CDC, 2013). The smoking rate for adults in the United States is 19.7%, and the difference between this rate and those suffering from an SMI shows a significant need for best practices to be implemented for the mentally ill population of South Carolina.

South Carolina and Its Tobacco History

Tobacco has been used for hundreds of years all over the world. Tobacco was introduced to Spain in 1519, and by the 1600s, its use had made it way all across Europe (Trinkley et al., 1992). It was brought to Europe from America where the Indians planted tobacco and used it for spiritual rituals and for curing many ailments (Trinkley et al., 1992). Tobacco was a universally accepted product all through Europe and in America, and during this time tobacco was smoked, chewed, and used for snuff; not much has changed in the hundreds of years since (Trinkley et al., 1992).

After the colonization of South Carolina, its residents had hoped that tobacco would become a profitable crop, but over time the state could not compete with the tobacco markets in Virginia and Maryland (Trinkley et al., 1992). Virginia and Maryland had strong export markets to Europe, where South Carolina was exporting to the West Indies and the market was not as large as the European market (Trinkley et al., 1992). Although tobacco production was a minor crop in South Carolina, it nonetheless continued to rise in popularity and price (Trinkley et al., 1992). As the landscape of South Carolina changed and tobacco became a stronger commodity, the population of South Carolina began to change as well. More and more White families were slave owners and the top crops of South Carolina became cotton and rice, and even though tobacco was not

the Number 1 crop, that early cultivation is what had led to the tobacco addiction of today (Trinkley et al., 1992).

Health Hazards of Tobacco Use

Tobacco dependence is the leading cause of preventable death in the United States (CDC, 2019; Prochaska et al., 2017). Smoking affects every organ of the human body, and continued use can lead to major health issues and diseases (CDC, 2017b). Smoke formation begins when a cigarette is lit and the individual takes a puff off of the cigarette or the continually burning of the cigarette between puffs (DHHS, 2010; FDA, 2018;). Mainstream smoke is released from the butt end of the burning cigarette, and side-stream smoke is released from the burning cigarette coal as it smolders; both of these types of smoke provide the person smoking and expose those around the smoke with various amounts of carcinogens and increase the chances of suffering from various health effects (DHHS, 2010).

Tobacco smoke contains a mixture of over 7,000 different chemicals, and 70 of those chemicals are known carcinogens (DHHS, 2010; FDA, 2018). These chemicals are developed in various stages of the manufacturing of the cigarette. For example: cadmium and lead are present in the tobacco plant itself, whereas some chemicals are added during the manufacturing process for a variety of reasons, including to decrease the harshness of the cigarette smoke, maintain freshness of the tobacco, control of the burn rate, and to mask the taste of lower quality tobacco (FDA, 2018).

Tobacco-specific nitrosamines are a class of chemicals that appear in the tobacco plant after the harvesting and curing (DHHS, 2010; FDA, 2018; Konstantinou et al.,

2018). Of the tobacco-specific nitrosamines, nitrosimine ketone and N-nitrosoanabasine are the most carcinogenic (FDA, 2018). They have been linked to the development of lung, pancreas, esophagus, and oral cavity cancer (Konstantinou et al., 2018). This is not an exhaustive list of chemicals that are found in tobacco products but is an example of the links to cancer and other health consequences of smoking.

Cancer

Decades of research have established that cigarette smoking is a major risk factor for developing the following types of cancers: lung, head and neck, pancreas, uterine and cervix, kidney, bladder, stomach, and colorectal (Little et al., 2018). According to the Report of the Surgeon General (2010), at least 85% of lung cancers are directly linked to cigarette smoke (p. 302). There is comprehensive evidence showing a causal relationship between smoking and lung cancer (DHHS, 2010). According to the CDC (2018), of those individuals that smoke, 15% to 30% will die from lung cancer (p. 1). Current and past research shows that cancer survivors that continue to smoke are at a higher risk of developing secondary primary cancers (Little et al., 2018).

The carcinogens in cigarette smoke bind to the deoxyribonucleic acid in human cells and cause a mutation in the oncogenes and tumor suppressor genes, and this can lead to the formation of cancer cells in the body (DHHS, 2010).

Cardiovascular Disease

Cigarette smoking is a significant cause of cardiovascular disease (CVD) in the United States (CDC, 2017a; DHHS, 2010). According to the CDC (2017), coronary heart disease and strokes are higher in the southern part of the United States compared to the

other parts of the country (p. 2). Increased rates of CVD are also seen in individuals that are exposed to second hand smoke (DHHS, 2010, 2014). In South Carolina, diseases of the heart are the second leading cause of death for all individuals (CDC, 2017).

The chemicals in tobacco smoke increase serum cholesterol levels, blood pressure, insulin resistance, and chronic inflammation that results in diabetes (DHHS, 2014). The more risk factors an individual has, the chance of developing CVD is greatly increased (DHHS, 2014). Already having CVD risk factors, such as high blood pressure, congestive heart failure, coronary artery disease, and stroke, and adding smoking will lead to atherosclerotic changes with a narrowing of the arteries, increasing the risk of thrombosis which can lead to cardiovascular events, such as a myocardial infarction (DHHS, 2010). Smoking less than five cigarettes per day has shown to increase an individual's risk of CVD (DHHS, 2010).

Respiratory Disease

The respiratory system extends from the nose and upper airway down to the surface of the lungs where the alveoli are found (DHHS, 2010, 2014). As a person inhales a cigarette, the smoke is moved from the mouth down through the airway, depositing itself on the alveoli (DHHS, 2010). As the gases from the cigarette are deeply inhaled, they are deposited in the lungs and leave substantial amounts of carcinogens and toxins deposited in the lungs (DHHS, 2010).

A smoker with an extensive pack year history can inhale a significant amount of smoke over their lifetime, which puts them at risk of developing chronic obstructive pulmonary disease (DHHS, 2010). Not only is there an increased risk of developing

significant diseases, a person can also develop or have an exacerbation of asthma, chronic bronchitis, and emphysema (DHHS, 2010, 2014).

In South Carolina, the top three causes of death are cancer, diseases of the heart, and respiratory diseases, and smokers are at an increased risk of developing these health problems (CDC, 2017b). The diseases put a burden on the South Carolina healthcare system, costing billions of dollars. In 2009, \$1.9 billion was spent on healthcare costs in South Carolina due to smoking (CDC, 2017b).

Mental Illness

The prevalence of smoking in individuals with a mental illness is 2 to 4 times higher than in the general population (Morisano et al., 2009). Even though smoking rates have declined in the general population over the last 6 decades, it is still disproportionate among individuals with mental illness (CDC, 2013; Morisano et al., 2009). According to Prochaska et al. (2017), of the 520,000 tobacco-attributable deaths each year, over 200,000 are from persons with a mental illness (p. 165). Smoking rates are the highest in this population, and the life expectancy among people living with mental illness is 25 years less than the general population; when the harmful effects of smoking are added, it drops the life expectancy even more (Le Cook, 2014; Prochaska et al., 2017). Individuals that have a mental illness tend to smoke more heavily, inhale more nicotine from the cigarettes, have more severe withdrawal, and more severe symptoms of their mental illness (Peckham et al., 2017).

According to George et al., (2012), people suffering from bipolar disorder and other mood disorders have a very high prevalence of smoking with a range between

50%–70% (p. 1). In addition to higher numbers of smokers, individuals with bipolar disorder who smoke suffer from a higher severity of manic and depressive symptoms and higher numbers of suicide attempts (George, Wu, & Weinberger, 2012; Prochaska et al., 2017).

Current research supports the link between depression and smoking and strongly shows that tobacco dependence can lead to major depressive disorder (MDD) (Morozova et al., 2015; Prochaska et al., 2017; Ziedonis et al., 2008). Numerous studies have shown symptoms of depression, anxiety, and schizophrenia are made worse within those individuals who smoke (Prochaska et al., 2017).

Mood and anxiety disorders remain the most prevalent psychiatric disorders (Morozova et al., 2015, Prochaska et al., 2017). According to Morozova et al. (2015), 59% of individuals that suffer from MDD are lifetime smokers (p. 687). As aforementioned, smoking increases depression symptoms, and current research has shown a significant drop in severity of symptoms after individuals quit (Morozova et al., 2015; Prochaska et al., 2017). Researchers have consistently shown that individuals with a mental illness are motivated to quit smoking and can quit without aggravating the symptoms of their disease; in fact, the best possible outcomes will be seen in those individuals that quit smoking (Le Cook et al., 2014, Prochaska et al., 2017).

Self-Medication Hypothesis

The self-medication hypothesis assumes individuals with mental illness need to smoke to lessen the symptoms they may be experiencing (Morozova et al., 2015; Prochaska et al., 2017). Documents from the “Truth Tobacco Industry Library” explain

how much tobacco manufacturers spent on research studies that support the self-medication theory in the mentally ill population (Prochaska et al., 2017). This particular belief has been challenged over recent years as research is proving long term smoking actually increases the risk of developing severe mental illness, such as, MDD (Morozova et al., 2015; Prochaska et al., 2017). Individual's with schizophrenia that also smokes have an increase in psychiatric symptoms and increase hospitalizations when compared to the general population (Morozova et al., 2015). Smoking also has shown to interfere with the effectiveness of psychiatric medications leading to lower therapeutic blood levels and higher doses make it very difficult to manage the medications (Prochaska et al., 2017). The self-medication theory continues to be challenged by the research community and proving that smoking only enhances the psychiatric symptoms and to achieve the best possible outcomes for those suffering from mental illness and tobacco addiction the best treatment a person can get to help them quit smoking.

Theoretical Foundation

SEM was first introduced as a model to understand human development. In the 1970's Bronfenbrenner introduced SEM and was explained through an illustration of nesting circles that places the individual in the center and surrounded the individual with various systems or environments (Kilanowski, 2017; King et al., 2018). The SEM helps to get an understanding of how people interact with their environment to enable behavior change (Golden & Earp, 2012).

When working within a population to create or encourage behavior change SEM is a strong model. SEM explains there are five levels of factors that influence behavior.

The levels are: intrapersonal, interpersonal, organizational, community, and public policy (King et al., 2018; Sallis et al., 2008). At the intrapersonal level an individual's personal beliefs, attitudes, knowledge and skills all influence behavior. At the interpersonal level are factors, such as family, friends, and peers. These provide identity and support (Sallis et al., 2008). At the organizational level are entities that constrain or promote behaviors, an example is local schools, or churches (Sallis et al., 2008). The community level has a much broader influence. This includes larger social networks, community and cultural norms. Finally the public policy level includes any local, state, and federal policies and laws that regulate and/or support healthy behaviors (Sallis et al., 2008).

According to Sallis et al., (2008) SEM is most powerful when it's behavior specific and most useful in research (p. 470). Individual counseling was introduced to decrease the number of smokers within the mentally ill inpatient population and that intervention will influence on the intrapersonal level. The goal is to increase the individual knowledge of the health hazards of smoking/tobacco use, to help the individual to learn the necessary skills to quit smoking/tobacco use, and maintain their quit. On the organizational level there are no smoking/tobacco policies at the hospital and the availability of NRT to all smokers/tobacco users to help prevent withdrawal and promote quitting.

Clinical Practice Guidelines

Exhaustive research has been done in the field of tobacco cessation, specifically smoking cessation, which has led to the creation of CPG that have been set forth by the

DHHS (2008) The guidelines were created from more than “8,700” research studies in the field of tobacco cessation (DHHS, 2008).

Approximately 20% of the United States population smoke today when compared to 42% in the 1960s (Baker, 2011). Although the rates have significantly decreased it appears that number has stagnated among certain population groups (Baker, 2011). For example, individuals that have lower incomes, lower educational attainment, and individuals that have SMI (Peckham et al., 2017).

There are many challenges to treating tobacco dependence and one significant challenge falls on the shoulders of clinicians (Baker, 2011; Peckham et al., 2017). Many clinicians do not offer cessation counseling at every visit or provide treatment to their patients who smoke (Baker, 2011). According to Fiore and Baker (2011), about 70% of smokers see a primary care physician each year which provides a unique opportunity for the provider to begin counseling regarding a patient’s tobacco use (p. 1223).

Not all smokers that see a provider are ready to quit smoking but research highlighted in the CPG and the 2018 American College of Cardiology expert consensus decision pathway on tobacco cessation treatment explains the most smokers lack motivation to make an attempt to quit smoking but with each attempt increases the likelihood of success (Barua et al., 2018; Services, 2008). The CPG was designed to provide clinicians with evidence-based guidelines to help treat their patients with tobacco dependence (DHHS, 2008). The model for treating tobacco use and dependence for all patients is to use the “5 A’s” (DHHS, 2008). Research shows that using the 5A’s at an outpatient doctor’s visit will increase the chances of that person making a quit attempt,

this should also be done during an inpatient stay to promote a quit attempt or to help to create a quit plan (Barua et al., 2018).

- Ask about tobacco use.
- Advise to quit.
- Assess willingness to attempt to quit.
- Assist in quit attempt.
- Arrange follow-up.

Summary and Conclusions

Smoking is the Number 1 preventable cause of premature death in the United States and in South Carolina (CDC, 2017). According to the CDC approximately 25% adults have some form of mental illness and consume 40% of all cigarettes smoked (CDC, 2013). In South Carolina, 23% of the population uses some form of tobacco, cigarettes being the most common at 21.5% (Nguyen, 2016). People that have a mental illness die sooner than individuals that do not have a mental illness and when the negative health effects of smoking are added to their disease, it makes this particular population vulnerable and in greater need of help in quitting smoking (Prochaska et al., 2017).

Studies have been conducted on various ways to address tobacco cessation within this population but none have included the expertise of a CTTS. The CTTS has extensive training and experience in behavior modification skills to aid the tobacco user in quitting. There is nothing in the current literature examining the impact of the CTTS on counseling the mentally ill patient (Association for the treatment of tobacco use and dependence [ATTUD], 2016). At the study site in the South Carolina, there is a dedicated CTTS for

all inpatient admissions. The CTTS has the time, education, and experience to provide a specific intervention for admitted patients with a mental illness and this is a topic that has very limited research available.

In the following chapter, the research method will be discussed. In depth information regarding the research design, sampling, recruitment procedures, inclusion and exclusion criteria, and data analysis will be presented.

Chapter 3: Research Method

In this study, my focus was ascertaining the benefit of 1 on 1 tobacco cessation counseling when comparing to group cessation education groups, both conducted by a CTTS. Tobacco use is the Number 1 cause of preventable death in the United States (Campaign for Tobacco Free Kids, 2020; CDC, 2013). Each year over 520,000 U.S. citizens die because of their tobacco use (Campaign for Tobacco Free Kids, 2020; CDC, 2013; Prochaska et al., 2017). In this chapter, I discuss the research design and rationale, methodology, data analysis plan, and threats to validity as well as provide a summary.

Researchers have examined the impact of addressing smoking in various settings, like the emergency department and primary care visits, but all of these situations have been studied regarding medical doctors, physician assistants, nurse practitioners, and registered nurses (Barua et al., 2018). This study was the first of its kind because of my focus on an inpatient psychiatric hospital with a CTTS providing the 1 on 1 counseling and access to NRT.

People with mental illness are disproportionately affected with high smoking prevalence when compared to the general population (Prochaska et al., 2017). The overall tobacco use rate in South Carolina, based on information from the South Carolina Behavioral Risk Factor Surveillance system is 23.1% , which is slightly higher than the national average of 18% (Nguyen, 2016). That number increases to 27% when users are dealing with a mental illness (CDC, 2013).

The CDC (2018) found that cigarette smoking was higher among men that were between 25–64 years of age, multiracial, only had a general education development

certificate, lived below the federal poverty level, lived in the South, were uninsured or were insured under Medicaid, had a disability, and had serious psychological distress (Jamal et al., 2018).

Research Design and Rationale

In this study, I used a quasi-experimental design to investigate the impact of switching from a once a week group tobacco cessation education class to a one-on-one counseling model that was conducted by a CTTS. The variables under study were: (a) independent: type of intervention (i.e., 1 on 1 versus group), (b) dependent: smoking status (i.e., quit versus smoking), (c) dependent: the number of patients that received any NRT vs no NRT, and (d) control variables: age, gender, and years of smoking. The variables were studied for the time period of six months prior to implementation of the 1 on 1 sessions (i.e., December 2016 to May 2017) and 6 months postimplementation (i.e., June 2017 to November 2017).

Methodology

Population

The targeted population were all psychiatric patients ages 18 years old and older that were identified as a tobacco user upon admission to the psychiatric hospital in South Carolina study site. In 2016, 18% of all admitted patients at the study site were identified as tobacco users. The Centers for Medicare and Medicaid Services (2018) explains, this is now a requirement upon hospital admission.

Sampling and Sampling Procedures

During the admission process, each patient is assessed for any tobacco use, including cigarettes, cigars, oral tobacco, and electronic cigarettes. This information is documented in the history section of the EMR. Every morning all EMR records of those identified as a tobacco user are uploaded to a software program called Telask, and the CTTS prints out the list of currently identified tobacco users.

I conducted an a priori power analysis to determine the sample size (see G* Power Calculator Universitat Dusseldorf, 2010). Since there were not similar studies using this population group, a medium effect size ($OR = 2$) was selected for regression analysis (Chen et al., 2010). The estimated sample size was 119 participants to achieve satisfactory statistical power (> 0.90), using the following power analysis:

z tests - Logistic regression

Analysis: A priori: Compute required sample size

Input: Tail(s): = One

Odds ratio: = 2

α err prob: = 0.05

Power ($1-\beta$ err prob) = 0.90

Output:

Critical *z*: = 1.645

Total sample size = 119

Actual power = 0.901

Inclusion Criteria

The inclusion criteria were all individuals 18 years old and older admitted to the study site that had been identified as a tobacco user.

Exclusion Criteria

All patients not admitted to the study site and any individuals under the age of 18 years old were excluded from data collection.

Procedures for Recruitment, Participation, and Data Collection (Primary Data)

This study was quantitative in nature, involving a quasi-experimental design. I collected data that had been entered from the CTTS into the Telask system. With institutional review board (IRB) approval, data were collected on all patients admitted to the psychiatric hospital that were identified as a tobacco user. These patients are given the opportunity to speak with a CTTS. The list generated through the Telask system determines what patients will be assessed and counseled. Because the patient is identified through the admission process and the tobacco assessment and counseling are offered to everyone, informed consent was not needed. Personal identifiers, such as medical record number, date of birth, and name were used to ensure the correct person was being assessed and counseled.

I collected all data for this study through the Telask system. After the CTTS counsels the patient, the data from the assessment form were then added to the Telask system and sent to a database for secure storage. Data were collected for six months prior to the pilot study and six months after the conclusion of the pilot project. Once a patient was discharged, they were no longer receiving active treatment and were placed into the

automatic, follow-up call system. The call frequency after discharge was at day 3, day 14, day 30, and days 60 and 180. The outcome measures were 30-day tobacco free prevalence.

Intervention

At the study site, all admitted patients that are identified as a tobacco user were given the opportunity to speak with the CTTS. During the visit, an assessment was completed. Upon completion of the initial assessment, the CTTS discussed creating a plan to quit, initiating NRT if not already started, the benefits of quitting, and how the patient's current tobacco use impacts their mental illness and/or addiction as well as will notify the resident and attending physician of CTTS recommendations for NRT and the patient's desire to be discharged with NRT or a prescription so they may obtain NRT at their chosen pharmacy. Each patient had the opportunity to opt out of counseling and/or NRT but will still receive follow up through the interactive-voice-response system (Nahas et al., 2016).

Archival Data

All data were collected through the CTTS and EMR system, then uploaded to Telask. I then requested the data via Telask for the aforementioned time points for analysis. I requested the data after receiving IRB approval through Walden University. Because there was an active contract between the study site and Telask, no additional paperwork was needed to be filed. All data were stored in a secure cloud storage system. My request for data was sent to the Telask team, and after all data had been gathered by Telask, they were sent to me in a secured document for analysis via a secured network.

Data Analysis Plan

The following research questions guided this study:

Research Question 1: To what extent does the type of intervention (i.e., one-on-one versus group counseling) affect tobacco cessation status (i.e., quit or smoking) while controlling for age, gender, and years of smoking.

Research Question 2: To what extent does type of counseling (i.e., one-on-one versus group counseling) affect patients' receipt of NRT while inpatient (i.e., any NRT medications versus no NRT medications), controlling for age, gender, and years of smoking.

I conducted data analysis through Statistical Package for the Social Sciences, a software package designed for statistical analysis (IBM, 2018). Data sets being analyzed were from December 2016 to May 2017 (i.e., group sessions) and June 2017 to November 2017 (i.e., individual sessions). Statistical analysis was conducted in three phases: (a) descriptive statistics for all variables (i.e., frequencies percentage for categorical variables and mean/standard deviation for continuous variables); (b) bivariate analysis for Research Question 1 chi-square test (independent variable (IV): type of intervention, dependent variable (DV): cessation status) and for Research Question 2 chi-square test (IV: type of intervention, DV: receiving NRT while inpatient), and (c) multivariable analysis (i.e., binomial logistic regression) was conducted for both research questions. More specifically, for Research Question 1, the outcome/DV was cessation status (i.e., success or failure) and the predictors were type of intervention, age, gender, and years of smoking. For Research Question 2, the outcome/DV was receiving NRT

while inpatient (i.e., yes or no) and the predictors were type of intervention, age, gender, and years of smoking. The statistical significance level was set at 0.05.

Threats to Validity

External Validity

One potential threat to external validity was that the study was only conducted at one psychiatric hospital; therefore, any generalization of the results to other populations should be done with caution. However, 1 on 1 counseling is conducted throughout the rest of the medical facility at the study site.

Internal Validity

Due to the nature of this research, there was not a significant chance of threats to internal validity. There was not a treatment group and control group but rather, I conducted the study to investigate whether more patients were reached through 1 on 1 counseling versus group counseling. In any case, internal validity was addressed with the use of the appropriate statistical analysis.

Ethical Procedures

As aforementioned, institutional permissions to talk to a patient were not needed. I obtained permission from the study site and Telask, the company that houses the data. All data were deidentified so they could be analyzed for the purposes of this study. Permission was also obtained through Walden IRB before the data were analyzed.

Each patient admitted to any study site system hospital is asked if they are a tobacco user. Once updated in the social history of their EMR, that information is managed in the Telask system and provided to the inpatient CTTS, every patient had the

opportunity to participate in 1 on 1 counseling. Participants were generated from the Telask list. Any ethical issues are addressed through yearly study site employee trainings.

I did not use recruitment materials for this study. Each patient that is identified as a tobacco user is asked if they would like to receive 1 on 1 counseling with a CTTS. If they choose not to participate, then documentation of the encounter and their refusal is made in their EMR, and they were not provided counseling.

Summary

The overall goal of this study was to show the potential benefits of conducting 1 on 1 counseling sessions with a CTTS versus group education sessions at the study site. I analyzed data sets from December 2016 to May 2017 (i.e., group sessions) and June 2017 to November 2017 (i.e., individual sessions) using descriptive statistics, bivariate analysis, and binomial logistic regression. Due to the design of the study, threats to external and internal validity were relatively small, and there were minimal threats to ethical procedures due to policies and trainings already implemented at the study site.

Chapter 4: Results

Tobacco use is the leading cause of preventable death and disease in the United States (CDC, 2017). Every year, approximately 520,000 U.S. citizens die prematurely due to their tobacco use (CDC, 2017; Prochaska et al., 2017). Individuals with mental illness are disproportionately affected by tobacco use (CDC, 2013b). According to the CDC (2013c), 36.5% of adults with any mental illness use tobacco. The purpose of this cross-sectional research study was to measure the effect of 1 on 1 tobacco cessation counseling versus group counseling on smoking cessation at an inpatient psychiatric hospital located in South Carolina. In this chapter, I present the results of the data collected during two different time points that compare group counseling for tobacco cessation versus 1 on 1 counseling. The dates of data collection were December 2016 to May 2017 (i.e., patients received group counseling) and June 2017 to November 2017 (i.e., patients received one-on-one counseling).

Study Sample

In this study, I evaluated the impact on smoking cessation rates when moving from a group tobacco counseling format to a one-on-one counseling format at an inpatient psychiatric hospital in South Carolina. I received IRB approval from both Walden University and the study site prior to data collection. Walden University's approval number is: 10-25-19-0331442 and the study site's approval number is Pro00092027. The secondary data included 1,224 men and women between the ages of 18 years and older that were identified as tobacco users. An a priori power analysis was conducted to determine sample size for this project. It was estimated that a sample size of

119 participants was needed to achieve satisfactory statistical power (> 0.90); the sample size for this study was 1,224 participants. Recruitment was not necessary because all individuals admitted to the hospital were asked about tobacco use and their responses were documented in the EMR. Once documented, the information was sent to a secure data repository called Telask. All data were deidentified. As can be seen in Table 1, all of the variables are categorical.

I conducted the data analysis in three phases. First, descriptive statistics for all variables was performed using frequencies (i.e., percentages). Secondly, bivariate analysis between each independent and dependent variable were calculated. For Research Question 1, a chi-square test was performed for the IV of type of intervention and DV of smoking cessation status. For Research Question 2, I performed a chi-square test with the IV of type of intervention and the DV of receiving NRT while inpatient. Lastly, a multivariable analysis (i.e., binomial logistic regression) was performed for both research questions. For Research Question 1, the outcome/DV was cessation status and the predictors were type of intervention, age, gender, race and years of smoking. For Research Question 2, the outcome/DV was receiving NRT while inpatient (i.e., yes or no) and the predictors were type of intervention, age, gender, race, and years of smoking.

Descriptive Statistics

Forty-five percent of the participants were between the ages of 29–50 years old, 30.1% were between 0–28 years old, and 24.6% were over 50 years old (see Table 1). Of the 1,224, 35.9% were female and 64.1% were male, and 42.2% were identified as White/Caucasian, 26.9% Black/African American, and 31% as other (see Table 1). The

intervention consisted of either group counseling or 1 on 1. Of the 1,224 participants, 595 or 48.6% had group counseling and 629 or 51.4% were given one-on-one counseling. Only 27% of participant group was given NRT during their hospital stay, while 73% was not given NRT. Smoking status and cigarette years (i.e., years of smoking) was also assessed. Thirty-five percent were everyday smokers, and 64.5% were nondaily smokers or had quit. When examining cigarette years, the highest group was the > 20 years at 43.3%, then 11–20 years group at 29.2%, and the lowest group was 0–10 years at 27.6%.

Table 1

Demographics of the Study Sample

		<i>N</i>	%
Age	0–28	368	30.1
	29–50	555	45.3
	> 50	301	24.6
	Total	1224	100.0
Sex	Female	440	35.9
	Male	784	64.1
	Total	1224	100.0
Race	White/Caucasian	516	42.2
	Black/African American	329	26.9
	Other	379	31.0
	Total	1224	100.0
Intervention group	Group counseling	595	48.6
	One-to-one	629	51.4
	Total	1224	100
NRT use in hospital	Yes	330	27
	No	894	73
	Total	1224	100
Cigarette years	0–10	135	27.6
	11–20	143	29.2
	> 20	212	43.3
	Total	490	40
	Missing	734	60
Smoking status	Every day	435	35.5
	Nondaily/quit	789	64.5
	Total	1224	100

Bivariate Analysis

Research Question 1: To what extent does the type of intervention (i.e., 1 on 1 versus group counseling) affect tobacco cessation status (i.e., quit or smoking)?

According to the chi-square test, the variables are not independent of each other and there is a statistical relationship between type of intervention and smoking status (see Table 2). In the group counseling intervention, there were 595 patients. Of that, 87 or 14.6% were smoking daily and 508 or 85.4% were not smoking daily or had quit smoking. The 1 on 1 intervention group included 629 patients, and 348 of those were reached and assessed, with 55.3% smoking daily and 281 or 44.7% not smoking daily or had quit smoking (see Table 2). This association had a moderate effect between the variables (Cramer's $V = .425, p < .000$) (Green & Salkind, 2014). Therefore, the null hypothesis was rejected because group counseling resulted in a higher proportion of participants who quit smoking when compared to 1 on 1 counseling.

Research Question 2: To what extent does type of counseling (i.e., 1 on 1 versus group counseling) affect patient's receipt of NRT while inpatient (i.e., any NRT medications versus no NRT medications)?

According to the chi-square test, the variables are not independent of each other and there is a statistical relationship between the type of counseling and receipt of NRT (see Table 2). Within the group intervention, 595 patients were included, and of that, 68 patients or 11.4% received NRT while in the hospital and 527 or 88.6% did not receive NRT while in the hospital (see Table 2). The 1 on 1 intervention group included 629 patients, and of that group, 262 patients or 41.7% received NRT while in the hospital

versus 367 or 58.3% who did not receive NRT while in the hospital (see Table 2).

Analysis (using Cramer's $V = .34$ and $p < .000$) showed a moderate effect between the variables (see Table 2). According to this result, one-on-one counseling resulted in a higher proportion of patients receiving NRT as compared to group counseling.

Table 2

Cross-Tabulation and Bivariate Analysis (Chi Square Test) Between Type of Counseling and Smoking Status and NRT Use

		Type of Counseling		χ^2	p	Cramer's V
		Group	1 on 1			
Smoking status	Everyday	87 14.6%	348 55.3%	221.135	< 0.0001	.425
	Nondaily/quit	508 85.4%	281 44.7%			
	Total	595 100%	629 100%			
NRT use in hospital	Yes	68 11.4%	262 41.7%	141.849	< 0.0001	.34
	No	527 88.6%	367 58.3%			
	Total	595 100%	629 100%			

Multivariable Analysis

To address both research questions, I conducted a binomial logistic regression. For Research Question 1, the outcome (or DV) was cessation status and the predictors were type of intervention, age, race, gender, and years of smoking. The DV, cessation status, was coded as: 0 = every day smoking versus 1 = nondaily smoking/quit. The results of the analysis indicated that the null hypothesis should be rejected (see Table 3). Group counseling resulted in higher numbers of patients quitting smoking when

compared to 1 on 1 counseling ($OR = 2.326$, 95% CI: 1.17–4.633). In addition, smokers who were smoking for 0–10 years found it more possible to quit smoking compared to those who were smoking for more than 20 years ($OR = 4.016$, 95% CI: 1.651 – 9.773). The Hosmer and Lemeshow test showed the results adequately fit the data at $p = 0.256$ ($> .05$). The Nagelkerke R^2 test showed a 15% variation in the outcome.

Table 3
Binomial Logistic Regression for Cessation Status (DV) With Predictors of Age, Gender, Cigarette Years, Race, and Intervention Group

	<i>B</i>	S.E.	Wald	<i>p</i> value	Odds ratio	95% C.I. for OR	
						Lower	Upper
Age (ref: > 50 years)			1.068	.586			
0–28 years	-.167	.553	.091	.763	.846	.286	2.503
29–50 years	.241	.427	.318	.573	1.272	.551	2.935
Female vs. male	-.354	.344	1.061	.303	.702	.358	1.376
Cig. years (ref: > 20 years)			20.49	0			
0–10 years	1.39	.454	9.392	.002	4.016	1.651	9.773
11–20 years	-1.031	.546	3.559	.059	.357	.122	1.041
Group counseling vs. 1 on 1 counseling	.844	.351	5.798	.016	2.326	1.17	4.623
Race (ref: other)			1.819	.403			
White or Caucasian	-.779	.577	1.818	.178	.459	.148	1.424
Black or African American	-.661	.587	1.265	.261	.517	.163	1.634
Constant	-1.919	.658	8.507	.004	.147		

For Research Question 2, the outcome/DV was receiving NRT while inpatient (i.e., yes or no) and the predictors were type of intervention, age, gender, race and years of smoking. The results of the analysis show that patients who were part of the group counselling sessions were less probable to receive NRT compared to those individuals that were in 1 on 1 counseling; therefore, I rejected the null hypothesis ($OR = 1.173$, CI 95%: .718–1.917). The Hosmer and Lemeshow test show the results adequately fit the data at $p = 0.566$ ($> .05$). The Nagelkerke R^2 test showed a 9% variation in the outcome.

Table 4

Binomial Logistic Regression for Receiving NRT While Inpatient (DV) With Predictors: Age, Gender, Cigarette Years, Race, and Intervention Group

	<i>B</i>	S.E.	Wald	<i>p</i> value	Odds ratio	95% C.I. for OR	
						Lower	Upper
Age (ref: >50 years)			.543	.762			
0–28 years	-.031	.386	.006	.936	.969	.455	2.065
29–50 years	.146	.274	.284	.594	1.157	.676	1.981
Female vs. male	.148	.214	.477	.49	1.159	.762	1.762
Cig. years (ref: >20 years)			11.778	.003			
0–10 years	.981	.332	8.733	.003	2.668	1.392	5.115
11–20 years	-.015	.272	.003	.957	.985	.578	1.68
Group counseling vs. 1 on 1 counseling	.159	.251	.405	.525	1.173	.718	1.917
Race (ref: other)			10.433	.005			
White or Caucasian	-1.241	.459	7.326	.007	.289	.118	.71
Black or African American	-.764	.466	2.681	.102	.466	.187	1.162
Constant	-.147	.497	.088	.767	.863		

Summary

The research questions determined the methodology of the study and the data analysis plan necessary to address them. I conducted the statistical analysis in three phases. The first analysis descriptive statistics was conducted on all 1,224 participants. The second analysis was a bivariate analysis. For Research Question 1, a chi-square test was performed for the IV of type of intervention and DV of smoking cessation status. For Research Question 2, a chi-square test was performed using the IV of type of intervention and DV of receiving NRT while inpatient. Finally, multivariable analysis was conducted for both research questions. The results showed when comparing group counseling to 1 on 1 counseling, more individuals quit smoking within the group counseling and the individuals in the 1 on 1 counseling group received more NRT while inpatient at the study site. In next chapter, I will present the interpretation of the results, recommendations, social change implications, and conclusions of this study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Smoking remains the leading cause of death and disability in the United States (*Smoking Cessation: A Report of the Surgeon General Executive Summary.*, 2020). In a recent report, the U.S. Surgeon General (2020) indicated reductions in the number of individuals that smoke have been significant over the past 60 years, going from 42.4% in 1964 to an all-time low of 14% in 2019. Overall, the results are promising, but there is still much work to be done. Of the current 14% of adult smokers, 36% of adult smokers are dealing with a mental illness (CDC, 2018).

The purpose of this correlational research study was to investigate the effect of different tobacco cessation approaches (i.e., group-based tobacco cessation education versus 1 on 1, individual tobacco cessation counseling) on the smoking status of a mentally ill population as well as how this method of counseling affects patient's receipt of NRT while inpatient (i.e., any NRT medications versus no NRT medications). I analyzed secondary data in this study through a three-step process. First, descriptive statistics for all variables were conducted. Secondly, a bivariate analysis was run between each independent and dependent variable. Finally, a multivariable analysis was conducted for both research questions. In this chapter, I present and interpret the key findings of this study and discuss recommendations, the social change implications, and the conclusions of the study.

Key Findings

The results of this study showed that for the population analyzed, the age group with the largest amount of smokers from the sample population were between ages 29 and 50 years old, 64.1% of the group were male, and the White/Caucasian subpopulation comprised a majority of the group at 42.2%. The longest amount of cigarette years was the > 20 years group. When comparing group versus 1 on 1 counseling and its effect on smoking cessation status, I found significantly higher numbers of cessation rates among those in the group sessions, but 1 on 1 counseling resulted in a higher proportion of patients receiving NRT than those in the group sessions.

Interpretation of the Findings

After the analysis of the data, I found that the age group of 29–50 years old had the largest amounts of smokers, followed by the group of 0–28 year old and > 50 year olds. For cigarette years, the largest group was the smokers that had been smoking for > 20 years. The CDC (2019) explained that 31.2% of high school students uses a form of tobacco. Young people's brains are more susceptible to the effects of nicotine because they are still developing into their early 20's (CDC, 2019). This fact could explain the high numbers of smokers that have been smoking for over 20 years. According to the CDC (2019), each day someone under the age of 18 years old tries his/her first cigarette, and of those youth that try cigarettes, many become daily, lifelong smokers. According to National Institute on Drug Abuse (NIDA) (2018), past and current research supports individuals that have a mental illness are predisposed to developing a drug addiction, such as nicotine addiction. Some individuals have a gene that, when activated, makes

them more likely to continue using tobacco (NIDA, 2018). In addition, people with mental illness tend to use tobacco as a form of self-medication (NIDA, 2018). When a person has a mental illness, the changes that occur in the brain enhance the rewarding effects of the nicotine, which will contribute to the person continuing to smoke (NIDA, 2018).

The data analysis for Research Question 1 revealed cessation rates were higher within the group sessions when compared to one-on-one counseling ($OR = 1.173$, $CI\ 95\%: .718-1.917$). After an extensive search of Cochrane, Medline, Google Scholar, and PubMed databases, I found limited research available on the various methods of tobacco cessation interventions; however, what is available suggests that group counseling yields higher cessation rates (Stead et al., 2016).

The higher cessation rates in group counseling can possibly be attributed to the group counseling being offered as voluntary, so only those individuals that were considering quitting smoking attended the group. Additionally, group counseling may provide a safe environment for patients to talk about their smoking and develop a bond with another smoker that will in turn be their support in quitting as well as learning about others' experiences regarding quitting. Most patients admitted to the study site have stays of at least a week and that gives time for the bond over quitting smoking to be strengthened as well as the sharing of knowledge and personal experiences surrounding quitting.

These findings align with the intrapersonal constructs of SEM that were discussed in Chapter 1. When an individual is participating in group cessation, there are factors at

play that impact the dynamic of the group. There is a sharing of beliefs, attitudes, and knowledge that can influence how each group member views a certain subject and that can be supportive and provide the opportunity for behavior change. These influences can have a significant role in an individual quitting smoking or choosing to use NRT (Kilanowski, 2017; King et al., 2018). As aforementioned, I chose this construct of SEM because the knowledge obtained by the individual will influence the other levels of their environment and help to change their behavior of tobacco use.

The analysis for Research Question 2 revealed higher proportions of individuals received NRT in those engaged in 1 on 1 counseling when compared to group counseling. When reviewing the data, I found 629 patients were in 1 on 1 counseling and 595 were in group counseling. More patients were reached through 1 on 1 counseling, but not a significant amount, with a difference of 34 patients. Of the 595 patients that were in the group intervention, only 68 patients received NRT and 527 did not receive NRT. When comparing to 1 on 1 intervention group of 629 patients, 262 received NRT and 367 did not receive NRT. The small amounts of patients that received NRT in group counseling could be due to the group format. An individual stating that they did not want a nicotine patch because they heard friends and family say it didn't work, could have a negative effect on another group member that was thinking about getting NRT. Additionally, in the group format, the counselor may not have been able to give the individual personal attention to provide an accurate dosing of the NRT, which can make a significant difference in severity of withdrawal symptoms (Prochaska et al., 2017). There

could have also been a disruptive patient interfering with the information being received by all patients.

The 1 on 1 format allows for a rapport to be developed between the CTTS and patient. This can result in a safe and confidential conversation that will allow for a quit plan to be created, including NRT that is specific to that patient's needs. Without the group dynamics, whether those be positive or negative, the 1 on 1 counseling may better allow for positive information to be shared regarding the safety and efficacy of NRT. In addition, 1 on 1 counseling also enables the CTTS to set up discharge NRT for the patient that the group setting does not allow for.

Research Question 2 partly aligns with the organizational construct of SEM. As explained by Kilanowski (2017), another level of influence on behavior change is the organizational level. In this level of SEM, there is a network of influences that can promote or constrain behaviors (Bronfenbrenner, 1977; King et al., 2018). Some examples are schools, churches, and for study purposes, the study site. It should be mentioned that a drawback of SEM is only two of the five constructs were able to be used. To use all five, it would require significant human, and funding resources that were not available. The biggest contributing factors are the no smoking policies at study site that must be followed by staff, patients, and visitors.

There are policies in place at the study site that all patients and staff must follow, and the policy that has had the biggest positive effect is that the study site is a tobacco-free campus and has been since 2011. When an individual is admitted to the study site, all of their belongings are taken and locked in a locker that only staff can access. NRT is

available but having the CTTS on staff and rounding daily to assess each person's tobacco use has increased the amount of NRT being given to patients. During the time period of December 2016 through May 2017, not every patient was assessed for tobacco use. This policy was encouraged but not required until 2017, at which point the study site began to implement changes in their admission assessment that required tobacco use to be assessed. Of all the research available on the topic of tobacco cessation, one thing is clear, for the best possible outcomes each person should be counseled to quit, given NRT, and should be followed for a significant amount of time to provide additional extensive behavior support to have long-term cessation (Stead et al., 2016).

Limitations

There were some limitations of this study and one of the significant limitations was the large sample size. This may result in finding statistically significant difference with minor practical implications. This limitation was addressed through reporting the effect sizes for both bivariate (Cramer's V) and multivariable (Odds Ratio) analyses. One of the limitations of the study was accurate information may not have been recorded through the patient interview. The group format makes it challenging to assess and collect all the pertinent information on each smoker. The 1 on 1 group has the limitation of the CTTS not correctly documenting into Telask. The current mental status of the patient can also impact the collection of accurate information. A patient could be off their medications and, therefore, having a psychotic episode or they could be acutely suicidal or homicidal, making it difficult to obtain any information let alone the correct

information. Cultural factors may also have prohibited the patient from providing accurate information.

Recommendations for Future Research

The newly gained data from this study may assist future research involving group and one-on-one counseling with the mentally ill. Extensive data are collected by Telask, and it would be beneficial if additional variables were studied to aid in the development of programs and treatment plans for inpatient, mentally ill individuals.

Methodological challenges during the study involved two different CTTSs collecting and imputing the data. Having multiple counselors counsel and input data allows for different experiences for the patient and the possibility that a good rapport was not developed, leading to inaccurate information being conveyed to the counselor. In addition, one counselor may have been more invested than the other, and therefore, did not try to obtain all of the data. Another challenge is the competency of each counselor. Each counselor's personal history and experience with smoking and cessation can make the focus of their help more on their personal strategy to quit rather than what is recommended. In future research, adding qualitative interviews, experimental or quasi-experimental research design could possibly yield better results.

Recommendations for Practice

Empirically, the findings suggest that individuals that participated in group counseling had better cessation outcomes than individuals who experienced 1 on 1 counseling. In addition, the data show that 1 on 1 counseling was better for patients to receive NRT than in the group setting. Because there is limited research available on the

success of different types of counseling for smoking cessation, the findings of this study will add to what is currently available and help establish best practices for mentally ill smokers during hospital stays. According to the CDC (2019), to have the best possible outcomes for smoking cessation, individuals should receive some form of counseling and medication treatment.

Social Change Implications

About 34% of adult smokers suffer from some mental illness (CDC, 2018).

Individuals that suffer from various mental illnesses die 5 years sooner when compared to the non-mentally ill population, and the negative health effects of smoking can lessen their years of survival even more. Not only does smoking exacerbate their symptoms, but it also can interfere with the effectiveness of their medications, making it more difficult to treat the patient (CDC, 2019).

Within 20 minutes of extinguishing the cigarette, the body is beginning to heal itself, so quitting almost instantly benefits the body (CDC, 2017a). When a person is admitted to the study site for an average stay of 1 week, the body is well on its way to healing from the years of smoking, and the longer they refrain from smoking, the more healing is accomplished. The best methods to quitting smoking are with FDA-approved medication for cessation combined with a form of counseling (i.e., group or 1 on 1; *Smoking Cessation: A Report of the Surgeon General Executive Summary.*, 2020; Stead et al., 2016).

When a person is admitted to the hospital, that is a prime opportunity to engage them and help them quit smoking. The findings of this study add to the already growing

body of knowledge that quitting smoking is the best way to improve overall health, including mental health. The results of this study can be used to help change policy for the mentally ill patient and could spill over to the general inpatient wards, resulting in positive social change. The Tobacco Treatment Program at the study site is always looking for ways to better treat the patients, and it is important to recognize the role of these results when changing, developing, and implementing tobacco cessation programs and policies at the study site.

Conclusion

The findings of this study show the benefit of offering admitted, mentally ill patients smoking cessation counseling and NRT. The tobacco treatment policies at the study site closely follow the recommendations set by the U.S. Surgeon General (2020) and the American College of Cardiology (2018) with both explaining the importance of using both FDA-approved medications and counseling to help people quit smoking. The results of the study may influence changes in health policy that will directly affect all tobacco users within the study site system and can promote social change throughout the community. The results of this study will contribute to the design of future public health programs and effective healthcare policies as well as the development of better treatment plans for all admitted patients, not just the mentally ill.

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