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Self-Efficacy: The Key to Smoking Abstinence?

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SELF-EFFICACY: THE KEY TO SMOKING ABSTINENCE?

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This is to certify that I have examined this
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and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by
the final examining committee have been made.

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Executive Summary

Objectives: The aim of this project was to determine if strategies designed to increase self-efficacy would improve smoking cessation rates in an adult outpatient population when compared to traditional smoking cessation practices.

Background: There are many challenges when individuals try to quit. Inability to quit and relapse are common. Identifying the most effective strategies to address both the physical and behavioral aspects of nicotine dependence is necessary to support smoking abstinence. In the literature, a causal relationship exists between high levels of self-efficacy and improved smoking cessation rates.

Methods: A feasibility study, using a pre- post-test design was used to explore whether strategies designed to increase self-efficacy increased the ability of individuals to quit smoking. The researcher designed strategies to increase self-efficacy modeled after two theoretical frameworks: Albert Bandura's Social Cognitive Theory and James Prochaska's Transtheoretical Model of Change. Ten patients enrolled in this study. There was no random assignment and participants did not have the same chance of being in the control or experimental group. The first five patients received standard treatment and the next five patients received enhanced self-efficacy treatment. The goal was to identify increased quit rates in the five patients receiving the treatment.

Results: Participants did not complete scheduled follow-up appointments so data obtained from the initial assessment could not be compared with subsequent assessments.

Conclusions: Individuals quitting tobacco have many challenges and are best addressed by the combination of medication and behavioral modification to support smoking cessation. An improvement in smoking cessation outcomes may be influenced by the addition of methods

designed to increase a person's level of self-efficacy or belief they can truly quit smoking. Creating more rigorous measures for patient accountability and follow-up are suggested to encourage patient compliance in future studies.

Chapter One

Background and Significance

Cigarette smoking is the leading cause of preventable morbidity and mortality in the United States (Center for Disease Control [CDC], 2014). Each year, an estimated 443,000 people die from smoking related diseases (CDC, 2014). Smoking can contribute to the progression of diseases like coronary artery disease, chronic obstructive pulmonary disease, and lung cancer and result in poorer health outcomes (CDC, 2014). Nicotine found in tobacco is a highly addictive substance making it difficult for users to quit. When nicotine is absorbed into the blood stream, there is a neural-chemical response in the brain that releases feel good chemicals influencing the habitual use of tobacco for people experiencing depression, anxiety, sadness or boredom (Anthenelli, 2014). Because nicotine is addictive, it is hard for many people to quit tobacco. For "at risk" populations smoking prevalence may be greater due to sociodemographic and environmental factors that promote stress and increase the likelihood of using tobacco. In the United States, adult smoking rates have dropped from 24.7% in 1997 to 18.9% in 2012 (Egan, 2013). Though the incidence of smoking is decreasing among adults, statistics show that disparities exist when evaluated by race, education, and socioeconomic status (Fernander, Resnicow, Viswantath & Perez-Stable, 2001).

Disparities

When the prevalence of smoking statistics are categorized by race/ethnicity, Native Americans account for 31.4%, Asians 9.2%, African American 20.6%, Hispanics 12.5%, and Whites 21% (CDC, 2013). "While blacks and whites have similar smoking rates, blacks smoke fewer cigarettes per day than whites, yet blacks have [a] disproportionately larger incidence and

mortality rates for some smoking related cancers" (Gundersen, Delnevo, & Wackowski, 2009, p. 553).

Low socioeconomic status (SES) is another factor that continues to be a significant predictor of smoking behavior (Fernander, Resnicow, Viswantath & Perez-Stable, 2011). Research findings show that smoking is more prevalent in low SES populations. For people living below the poverty level, 28.9% smoke, compared to 18.3% that live at or above the poverty level.

Individuals with a general education degree (GED) versus a high school diploma have significantly higher rates of smoking (Fernander, et al., 2011). The smoking rates based on type of degree are:

- About 24 of every 100 adults with 12 or fewer years of education (no diploma) (24.2%) (CDC, 2015, paragraph 2)
- More than 41 of every 100 adults with a general education degree (GED) certificate (41.4%) (CDC, 2015, paragraph 2)
- 22 of every 100 adults with a high school diploma (22.0%) (CDC, 2015, paragraph 2)

In Minnesota, smoking disproportionately impacts people of low socioeconomic status (SES). Smoking affects some groups more than others, including those with lower income and lower educational achievement (ClearWay Minnesota, 2012, p. 1). These statistics describe the negative impact of smoking on underserved populations. For this reason, it is crucial to identify strategies that can best support a person's ability to quit tobacco.

Problem Statement

Many programs have been developed to address smoking cessation, but according to the American Cancer Society (ACS), about 42 million (1 out of every 5) adults in the United States currently smoke. Only about 4% to 7% of people are able to quit on any given attempt without medications or other help (ACS, 2014). Due to the negative health effects of tobacco, it is important to identify the most effective strategies to address both the physical and behavioral aspects of nicotine dependence to support smoking abstinence.

Purpose

Quitting tobacco has many challenges and it is often difficult for people to quit. It is not uncommon for some people to attempt standard smoking cessation treatments and continue to smoke. Frequent relapses from tobacco can lead to a sense of failure and belief they can never stop tobacco. The purpose of this project was to identify and evaluate new strategies that can be added to a traditional smoking cessation program to increase smoking cessation rates in an adult outpatient population.

Objectives

The main objective for this project was to identify new strategies that can be added to a traditional smoking cessation program to improve smoking abstinence rates in an adult outpatient clinic. This process began with a literature search to identify best practices to address smoking cessation and behavioral patterns that influence a person's ability to quit smoking. The goal was to identify new strategies to support smoking cessation. A feasibility study of pre- post-test design was created to evaluate the impact of these new strategies on smoking quit rates in an adult outpatient clinic.

Opportunities

The Centers for Medicare and Medicaid Services (CMS) have mandated a reduction in payments to hospitals with excessive readmission rates. At the site of this systems change project, hospital readmission data were collected for one year; the data were reviewed and patterns identified. Smoking was identified as a contributing factor toward higher readmissions rates. As a result, tobacco cessation became a part of the strategic plan, and a role became available for the researcher to develop an outpatient smoking cessation program.

Challenges

The challenges for this study were related to the nature of smoking cessation in and of itself. Research findings illustrate that quitting smoking is difficult and often leads to relapse and continued use of tobacco. It was hypothesized that it may be difficult to recruit and retain participants for this project. Recruitment can be slow at onset with the development of any new program. Limited referrals would affect the generalizability of this study due to small sample size.

Summary

Nicotine found in tobacco is a highly addictive substance making it difficult for users to quit. Though the incidence of smoking is decreasing among adults, disparities exist when evaluated by race, education, and socioeconomic status. The health of individuals who continue to use tobacco can be negatively impacted resulting in frequent visits to the hospital. To reduce smoking prevalence, it is necessary to identify specific factors that interfere with successful smoking abstinence and create new strategies to address those factors. This project focused on identifying new strategies that can increase a person's level of confidence and belief they can truly quit smoking to positively impact smoking cessation rates.

Chapter Two

Theoretical Framework

The researcher used two theories to create the theoretical framework for this project: the Social Cognitive Theory (SCT) by Albert Bandura (Bandura, 1977) and the Transtheoretical Model of Change (TTM) by James Prochaska (Prochaska & De Clemente, 1983). These two theories describe the influence of self-efficacy on behavior change and how behavior change occurs.

Social Cognitive Theory

Psychologist Albert Bandura (1977) created a theoretical framework called Social Cognitive Theory which explains how a person's degree of self-efficacy (or belief they can make a behavior change) is influenced by observational learning and social experiences. Self-efficacy is at the center of Social Cognitive Theory. There are four major psychological processes that influence self-efficacy and affect human functioning. These processes are:

1. Cognitive Processes: A person's belief shapes their self-efficacy
2. Motivational Processes: People form beliefs of what they can do. Self-efficacy plays a role in motivation.
3. Affective Processes: Self-efficacy is the ability to exercise control over stressors. The inability to exercise control can result in anxiety and depression.
4. Selection Processes: The development of self-efficacy related processes influences a person's ability to exercise control over day to day stressors (Bandura, 1994).

The most effective way to acquire a strong sense of self-efficacy is by mastery of experiences. To increase a person's ability to exercise influence over created goals requires structuring ways to build coping skills and instill beliefs the goals can be achieved. This ability to exercise self-

influence provides a major cognitive mechanism for motivation. People often rely on their emotional and somatic states when judging their capabilities. They often interpret tension and anxiety as a sign they can't complete the task. A positive mood is associated with a higher perceived self-efficacy; a negative mood decreases it. Providing a way to reduce tension and stress can help to increase self-efficacy (Bandura, 1994).

Bandura described four main sources that influence the development and maintenance of a person's self-efficacy: performance accomplishments or mastery experiences, vicarious experiences, verbal or social persuasion, and physiological, or somatic and emotional states. Individuals with higher levels of self-efficacy believe that they have the capability to exert control over stressful situations and can:

1. Approach difficult tasks as challenges to be mastered;
2. Set challenging goals and maintain strong commitment to them;
3. Heighten or sustain their efforts in the face of failures or setbacks;
4. Attribute failure to insufficient effort or deficient knowledge and skills which are acquirable; and
5. Approach threatening situations with the assurance they can exercise control over them.

An increased sense of control can be achieved by modeling the behavior of others and gaining confidence. (Bandura, 1994, p. 2).

Several studies have examined the relationship between self-efficacy and smoking cessation. Mudde, Kok, and Strecher (1989) found that efficacy beliefs increased after treatment, and those who had acquired the highest levels of self-efficacy remained successful quitters as assessed in a one-year period.

Transtheoretical Model of Change

The Transtheoretical Model of Change (TTM) is an integrative model of behavior change developed by Prochaska & DiClemente (1983). Health professionals have used the TTM to develop effective interventions to promote health behavior change. This model focuses on the decision making of an individual based on the influence of various emotions, cognitions, and behavior. The TTM model describes how people can modify an unhealthy behavior to acquire a new, healthier behavior. There are five stages of change in this model, and they include:

1. Precontemplation; Patient does not plan to take action with behavior change.
2. Contemplation: Patient is weighing the pros and cons of behavior change.
3. Preparation: Patient has decided to make a behavior change.
4. Action: Patient has a plan in place and is working toward the behavior change.
5. Maintenance: Patient has successfully achieved the behavior change and is working on preventing relapse (Velicer, Prochaska, Fava, Norman & Redding, 1998).

The core components of this model are the process of change, decisional balance, self-efficacy, and temptation. Decisional balance is a key component of behavior change. It reflects the individual's relative weighing of the pros and cons of making a change. Tied into this process is self-efficacy, having the confidence to cope with high-risk situations without relapse. The Situational Temptation Measure reflects the intensity of urges to engage in a specific behavior when in the midst of a difficult situation. Self-efficacy plays a key role providing confidence not to engage in a specific behavior like smoking. Measuring self-efficacy and situational temptation can help to predict which individuals are likely to relapse (Velicer, et al., 1998). The TTM model can be utilized at the individual level or in a population setting.

These two theories were used to guide this project focusing on identifying strategies to increase confidence and self-efficacy that could be added to a traditional smoking cessation program with the goal of shifting the decisional balance toward quitting smoking.

Ethics and Social Justice

The ethical framework selected to support this program was derived from the American Nurses Association's document *Nursing's Social Policy Statement: The Essence of the Profession (*ANA, 2010*).* This framework outlines nursing's relationship with society and nursing's obligation to those who receive nursing care. One of the social concerns stated in the policy statement is:

> *Quality health care is a human right for all. To improve the quality of care, healthcare professionals must address these complex issues: increasing costs of care; health disparities; and the lack of safe, accessible, and available healthcare services and resources.* (ANA, 2010, p. 8).

Nursing interventions "are intended to produce beneficial effects for the patient, family, or community" (ANA, 2010, p. 13). Strategies identified to increase the potential for an individual to exert control over their level of motivation and stop using tobacco would be a nursing intervention that benefits the patient, family, and community.

According to the Catechism of the Catholic Church (1994), *Catholic Social Teaching* supports putting the needs of the poor and vulnerable first. If socioeconomic deprivations increase the likelihood to use tobacco, individuals with low SES are at greater risk for death and disease, clearly an issue of social justice which needs to be addressed.

Literature Review

The researcher conducted a database search to secure peer-reviewed research for best practices for smoking cessation. Databases examined included Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, Medline, and the Cochrane Database of Systematic Reviews (CDSR). Key words for the search included *best practices for smoking cessation, advanced practice nurse, self-efficacy, health coaching and motivational interviewing*. Search parameters included articles from the last five years and English language journals only. The researcher identified and reviewed government websites that provide policy and health information that were identified through this search.

Research Themes

The search yielded two main themes for best practices to address smoking cessation: the use of medications and behavioral interventions. The topic of behavioral change included the use of motivational interviewing, health coaching, and high levels of self-efficacy to influence motivation.

Critical Analysis of Evidence Related to the Clinical Question

The clinical question for this study was "*How does the implementation of strategies designed to increase a person's degree of self-efficacy impact smoking cessation rates in adult outpatient population when compared to traditional methods?* There was extensive evidence in the literature to support smoking cessation, but not all evidence was equally valid, reliable, and relevant. The literature search yielded nine articles, one set of clinical practice guidelines, and one meta-analysis related to smoking cessation medications. Individual studies will be reviewed first, followed by the review of the clinical practice guidelines and meta-analysis.

Smoking Cessation

Medications. Three studies (Dezee, Wink, & Cowan, 2013; Kotz, Brown, & West, 2013; Kralikova, Kmetova, Stepankova, Zvolska, Davis, & West, 2013) discussed combining medications and behavioral interventions to support smoking cessation. Dezee et al. (2013) acknowledged that the best practices for smoking cessation were the combination of counseling and medications. The aim of their study was to compare the effectiveness of internet-based tobacco counseling versus in-person counseling and taking Varenicline. The investigators conducted a randomized control trial in a military medical setting of patients in the active phase of quitting. Quit rates were defined as abstinence at 12 weeks and confirmed by exhaled carbon monoxide testing. The findings revealed a 43% completion rate at 12 weeks; internet-based counseling was 21% (36/173) and in-person counseling 18% (8/44), p=0.7. Similar quit rates between the two groups suggested that internet counseling may be equivalent to in-person counseling and medication.

The strength of this study was a study design appropriate for the clinical question. Weaknesses of this study were methodology and data analysis. The study was terminated early due to concerns about new information and potential side effects of Varenicline. The original enrollment was set at 600 which would provide a statistical power of 99%. In-person counseling sessions were limited in number, so equal randomization to study groups could not occur. The number who completed the study were not similar: in-person counseling group: n=8 (18%) and Internet group: n=36 (21%). There was the potential for bias with uneven assignment into groups. Therefore, the validity of this study is reduced because of small completion rate and potential for bias. These factors could result in a Type II error to find a difference when one

exists. Most significant was a reported *p*-value of 0.7 which is statistically insignificant to establish a true difference in the populations.

Kotz et al. (2103) conducted a study to compare two medications often prescribed for smoking cessation in a clinic setting and available over the counter for the general population. The different treatments included the use of prescription medication for smoking cessation combined with behavioral support by a health professional, or an individual buying nicotine replacement therapies over the counter, not supported by behavioral support. The two medications compared were Varenicline and Nicotine replacement therapies (NRT). The design included a prospective cohort study of 270 adults participating in a household survey who smoked at baseline and had their smoking status assessed at six-months. The aim was to look for an association between smoking abstinence and use of different smoking cessation treatments. The Fagerstrom questionnaire, a common instrument to determine nicotine dependence, was completed by each participant. Variables measured had a potential relationship with smoking cessation. The number of quit attempts, along with demographic characteristics were evaluated by statistical analysis. Findings noted were an adjusted odds ratio of non-smoking in users of Varenicline that were 3.83 times higher (95% CI=1.88-7.7) compared to users of the NRT group.

One strength of this study was a sample size large enough to determine an adequate power level. A large sample size allowed for an increased confidence level to assess the effectiveness of medications for smoking cessation combined with behavioral support in comparison with unaided quitting. Participants provided a self-report of days smoking and quit attempts over a six-month period which resulted in problems with recall bias. Though this article had some weakness, the primary outcomes were addressed. Better outcomes were achieved

when prescription medications were used in combination with behavior support by health professionals, when compared to nicotine replacement therapy (NRT) bought over the counter.

Kralikova et al. (2013) completed a 52-week study that measured abstinence rates of smokers being treated with Varenicline versus NRT. The study design was a prospective cohort of 855 smokers in a smoking cessation clinic. All patients received behavioral interventions but made a choice of whether to use NRT (n=336) or Varenicline (n=519). Abstinence from tobacco was determined by carbon monoxide in expired air. The 52-week abstinence rates were 42.8% versus 31.0% in those using Varenicline versus NRT, respectively ($p<0.001$). After adjusting for all baseline smoking characteristics variables, the odds of remaining abstinent for 52 weeks was 2.03 (95% CI: 1.46-2.82) in favor of Varenicline over NRT.

Strengths of the Kralikova et al. (2013) study included a study design appropriate for the clinical questions and a good sample size. Statistical significance was secured using appropriate statistical measures with a *p*-value less than the significance level.

Weakness of the Kralikova et al. (2013) study included a risk of bias because patients were able to choose their own medications. Choosing one's own medication is a confounding variable that could result in a Type II error. Patients receiving inaccurate instructions on how to perform the expired carbon monoxide testing could impact results too.

Behavioral interventions. Two studies (Smit, Evers, De Vries, & Hoving, 2013; Vidrine, Shete, Cao, Greisinger, Harmonson, Sharp, … & Wetter, 2013) assessed different components of behavioral interventions to support smoking cessation. Smit et al. (2013) assessed the effectiveness and cost utility of using an internet-based tailored computer program and counseling by nursing and compared it to care as usual. Inclusion and exclusion criteria determined the sample size of 414 eligible smokers. A randomized control trial was conducted,

dividing smokers to one of three groups. The three groups included of smokers who: received multiple tailoring and counseling (n=163), multiple tailoring only (n=132) and usual care (n=119). A self-report of quality of life and cost data was provided at 12 months. Participants received a monetary payment for completion of the online questionnaires to assess smoking status. Tobacco dependence was determined by the completion of the Fagerstrom questionnaire.

A weakness of this study was the use of self-report to acquire information which can affect validity because no standard categories for responses were provided. Missing data were documented. High dropout rates impacted power analysis. Attrition led to skewed randomization into the intervention groups at baseline. Monetary benefit for participants can create bias and affect validity of the results. Outcome results varied based on what intervention was being considered. When quality of life was considered, care as usual was identified as higher. The internet–based tailored computer program was more cost effective in supporting smoking abstinence. These study weaknesses limit its value and applicability of results.

When addressing smoking status at a clinic appointment, Vidrine et al. (2013) tested a new behavioral intervention approach. Ask-Advise-Connect (AAC) was designed to address barriers to linking smokers with treatment. The study design was a randomized control method with two treatment arms involving ten family practice clinics in a metropolitan area. Patients from five clinics were randomly assigned to the AAC intervention and patients from the other five clinics were randomly assigned to or the Ask-Advise-Refer (AAR). The AAC group (n=2052) was linked to a quitline at the time of the appointment. In the AAR clinic (n=1611), smokers were given information and told to call a quitline on their own. The data were analyzed using *p*-values and odds ratio statistics. A 13-fold increase in the proportion of smokers enrolling in treatment was higher in the ACC group. This evidence supports the benefit of

directing patients to a quitline to support smoking cessation. The design was a strength of the study because the main outcome was to measure the treatment results between groups. Validity of the results was supported by a $p<0.001$ for the ACC results which was statistically significant. Results of this study are positive and would be applicable to clinical practice.

Nurse as an Educator

Patient education is an essential nursing intervention. A group of researchers (Chan, Jayasinghe, Christi, Laws, Orr, Williams, … & Harris, 2013) evaluated the health outcomes of patients instructed to improve their health by participating in behavior change. Their study was a quasi-experimental design with one group receiving instruction from generalist nurses (n=129) and the other group being a control. Nurses supporting the intervention group received education by participating in interviews and focus groups designed to facilitate changes in their practice. The practice changes included incorporating service level interventions, such as patient assessment and brief interventions to support healthy lifestyle changes in their care of patients. Patients were randomly selected and placed into either an intervention group (nurses received training) or a control group (usual care). Lifestyle risk factor management was collected by self-report via an on-line survey. A score was calculated for each risk factor by totaling scores. ANOVA analysis was used to assess the differences between the groups. Outcomes were improved when nurses provided education on each behavioral change topic.

The researchers provided a list that fully explained the utilized interventions which was the strength of the study. Another strength was the chosen interventions were associated with positive impact on lifestyle changes in patients, the goal of this study. A quasi-experimental study is less rigorous than a random control trial. A major weakness of the study was a low overall response rate of 54/129 which affects generalizability. The survey included a 7-point

Likert scale which was pilot tested before it was distributed. Though findings by a self-report may be biased, the use of a pilot study helps to increase clarity by testing for discrepancy of survey responses.

Results suggest that nurse's education on lifestyle management can influence the health outcomes of their patients. Though weaknesses exist in this study, the nurse's education of patients was an important part of behavior change.

Providing an intervention is not the only strategy for promoting behavior change. Each individual has unique characteristics and this may have an influence on outcomes. The ability of each individual to be motivated and believe change can happen often varies. Boogar and Mirkouhi (2013) studied self-efficacy and mindfulness to understand how they may influence smoking cessation rates. The researchers conducted a descriptive study on a convenience sample of 284 people who were attending ten smoking cessation clinics in Tehran. All participants completed the Smoking Self-Efficacy Questionnaire (SEQ-12). The main variables that predicted smoking cessation were self-efficacy (OR=9.81; CI: 3.12-17.28%) and mindfulness (OR=5.66; CI: 1.226-11.258%). Rigor was supported by ongoing evaluation of the SEQ-12. No established reliability was reported for the questionnaire. A strength of this study was that the research results supported an intuitive concept, that higher degrees of self-efficacy may improve smoking cessation outcomes. A convenience sample likely reduces generalizability because results in the sample may not be representative of the population. Researchers concluded that promotion of self-efficacy could be used as a therapeutic intervention for smokers. This information may be applicable to clinical practice but should be researched under a more rigorous study design.

Self–Efficacy

The researcher identified two additional articles that found a relationship between increased self-efficacy and smoking cessation rates. Jardin and Carpenter (2012) identified 849 smokers not interested in quitting tobacco who were already participating in a randomized controlled trial to promote tobacco quit attempts and cessation. While this study was built on existing literature about this topic, most studies defined a quit attempt as lasting at least one day. To reduce bias, it is important to examine both self-defined quit attempts and 24-hour quit attempts. Participants were recruited proactively through a national market research firm. One of the inclusion criteria was being a current cigarette smoker of greater than ten cigarettes per day. Upon receipt of a consent and baseline questionnaire, participants were randomly placed into one of two intervention groups: practice quitting attempts (PQA) through a behavioral exercise or PQA combined with Nicotine Replacement Therapies (NRT). The study findings confirmed that for smokers not currently interested in quitting, self-efficacy and motivation were key factors in the cessation process. Several measures were evaluated through a multivariate logistics approach. Among all the variables analyzed, self-efficacy emerged as the only variable consistently linked with all outcomes examined. NRT has been reported to increase a person's self-efficacy by reducing withdrawal and cravings, increasing one's sense of self-control over tobacco. In addition, placing the focus around motivational interventions can support quit attempts through confidence building activities and refraining from smoking. Limitations of the study were reliance of self-report of smoking status and recall regarding past quit history which can both result in bias. The study group was homogeneous as 87% were Caucasian. This composition does not address the influence of cultural differences of a heterogeneous sample.

In their research, Perkins, Parzynski, Mercincavage, Conklin, and Fonte (2012) studied the influence of self-efficacy on behavior change and smoking cessation. Two studies were simultaneously followed: study one lasted four weeks, and study two lasted six weeks. Study one included the use of the nicotine patch and a placebo nicotine patch. Study two studied the use of Varenicline and a placebo. A one-item self-efficacy scale was created. Patients in both groups were asked to respond to the self-efficacy measure the next day and at one week. Study group two required additional time due to the requirement of tapering up the dose of Varenicline. The one-item self-efficacy measure asked was, "I am confident I will not smoke at all tomorrow." The measure was rated on a 1 to 100 scale. ("1" represented "not at all" and "100" represented "extremely"). To identify if self-efficacy predicted the likelihood of not smoking the follow day, the transition from baseline to post-treatment was examined. The results showed that a higher rating of self-efficacy predicted next day's abstinence in both studies. For every 10-point increase in self-efficacy, the next day abstinence report increased by 0.287 (Odds Ratio: 1.33) in the patch study and by 0.262 (Odds ratio: 1.29) in the Varenicline study. The findings support that self-efficacy can be used as a predictor for smoking abstinence and may influence subsequent smoking behavior change. A limitation of this study was the reliance on self-report.

Motivational Interviewing

Motivational interviewing (MI) is another behavioral intervention that shows promise in improving smoking cessation outcomes. MI is a communication tool used by a health coach or health care provider to help patients identify ambivalence with making a behavior change and provide support to identify self-motivation. Researchers (Lindqvist, Forsberg, Rosendahl, Enenbringk, & Helgason, 2013) stated that MI appears to increase the effectiveness of smoking cessation counseling when integrated into standard treatment. When MI and Cognitive

Behavioral Therapy (CBT) were integrated into smoking cessation counseling, six-month continuous abstinence rates increased by 5% (Lindqvist et al., 2013). Lindqvist et al. used a randomized control design along with a sample size of n=772 which created a high-quality study. The interventions, outcomes, and statistics were applicable to the clinical question. Results illustrated a meaningful association between motivational interviewing and smoking cessation. A statistically significant result (p=0.047) indicates a likely link between increased self-efficacy and smoking cessation for continuous abstinence at six months for patients receiving motivational interviewing. Motivational interviewing can positively influence self-efficacy, so could adding motivational interviewing be the key to assist patients unable to quit? Further study is needed to determine the influence of motivational interviewing and an increased sense of self-efficacy on smoking cessation outcomes.

National Practice Guideline Review

The researcher conducted a database search to identify clinical practice guidelines that could provide recommendations to address smoking cessation in clinical practice. A systematic review resulted in the identification of the Clinical Practice Guidelines: Treating Tobacco Use and Dependence: 2008 Update (Fiore, Jaen, Baker, Baily, Benowitz, ...& Wewers, 2008). The Cochrane Review rated the quality of the evidence as high (Fiore et al., 2008). The study design supported the highest quality evidence completed by a systematic review and meta-analysis of 11 specific topics. A thorough database search was completed and relevant studies were unlikely missed. A detailed analysis was completed by a panel of experts knowledgeable in this area, based on clinical experience and expert opinion. Strong evidence was available to support using the 2008 Clinical Practice Guidelines in clinical practice. The purpose statement was clearly stated. Appropriate inclusion/exclusion criteria were provided. An Agree II tool was used to

appraise the guidelines. An evaluation of six domains resulted in the highest possible scores. Evidence and statistical significance were provided for each recommendation. The guidelines are reviewed regularly and updates are provided. These guidelines provide a robust review of the evidence and valid recommendations available for clinical providers to use in practice. The overall rating of these guidelines was seven, the highest possible level of quality.

Meta-Analysis Review

The researcher searched the Cochrane Database of Systematic Reviews (CDSR, 2014) to identify pharmacological interventions for smoking cessation. This search yielded a study by Cahill, Stevens, Perera, and Lancaster (2013) that identified 12 treatment-specific reviews. The analysis covered 267 studies, involving 101,804 participants. These reviews were conducted between 2008 and 2012 and all studies were random control trials. An AMSTAR tool was used to assess the quality of the systematic reviews. Nine domains were addressed against nine different smoking cessation medications. Characteristics of the included reviews compared interventions (one specific smoking cessation medication) against a comparison (either placebo or a different smoking cessation medication). Outcomes were measured at six months or 12 months. Limitations were reported as obtaining information from abstracts of four Level B trials; a lower quality trial. Most trials did not report methods in enough detail to assess the quality of randomization.

Summary

Researchers identified that smoking cessation in the population is best addressed by the use of medications and behavioral interventions. Evidenced-based practice guidelines are available to help guide practice. In several studies, smoking cessation outcomes were improved with the use of Varenicline. However, since each patient has unique issues and characteristics,

an individualized treatment plan is recommended. There are many variables that can affect positive outcomes. Access to a medical provider or simply a lack of time may require the use of an online program over a face-to-face appointment with a clinic provider. In the literature, best practices for smoking cessation include the use of evidence-based practice guidelines to support smoking cessation. Since a link has been found between high levels of self-efficacy and increased smoking cessation rates, and MI is effective with working through ambivalence to make a behavior change, a combination of all three approaches may provide the answer. Further study is recommended to explore this relationship.

Level and Quality of the Evidence

The research question addressed in this paper explored the relationship between strategies designed to increase a person's degree of self-efficacy and the impact on smoking cessation rates. All research reviewed for this project was ranked and assigned a level of evidence (see Appendix A for descriptions of levels of evidence) and a quality rating (See Appendix B for grades of recommendations). Vidrine et al. (2013) was rated as a Level Five, Quality A, or highest quality. Five studies are rated Quality B or good quality (Chan et al, 2013; Dezee et al., 2013; Kotz et al., 2013; Kralikova et al., 2013; and Lindquist et al., 2013); two studies are rated Quality C or low quality (Boogar & Mirkouhi, 2013; Smit et al., 2013). One study was rated as a Quality D or low quality study (Perkins et al., 2012). However, robust recommendations were provided by the 2008 Clinical Practice Guidelines. The Grading of Recommendations Assessment, Development and Evaluation (GRADE) scale was used to determine the strength of evidence. The GRADE scale assigned to the 2008 Clinical Practice Guidelines was Code A, indicating the quality of evidence was high.

Integrative Review

There is a large body of evidence in the literature to support smoking cessation. The findings indicated that smoking abstinence was best achieved by a combination of medications and behavioral interventions. The gold standard for smoking cessation information was Clinical Practice Guidelines: Treating Tobacco Use and Dependence: 2008 Update (Fiore et al., 2008). These guidelines have been rigorously evaluated and have been proven to be safe and effective. These guidelines have been adopted by practitioners yielding positive practice changes. Medical providers can combine the information in the guidelines with their clinical judgment to individualize care for each patient. Best practice recommendations resulted in clinical practice guidelines that are valid and backed by physician leaders and validated by the Agency for Research and Healthcare Quality (AHRQ). While these guidelines are available and used, gaps still exist in regards to positive or permanent behavior change because people are still smoking.

Summary of Recommendations

Many smokers find it hard to quit because nicotine is addictive. For people ready to quit, a discussion with their health care provider may provide direction and support. To provide safe and effective care for each patient, identification of best practices that are valid can help to guide care. The 2008 Clinical Practice Guidelines: Tobacco Use and Dependence (Fiore et al. 2008) were often referenced as the primary source of evidence for smoking cessation. Quitting tobacco has many challenges and is best addressed by the combination of medications and behavioral modification to support tobacco abstinence. Health care providers play a major keep role in promoting healthy behaviors and supporting behavior change, but some lack the appropriate education and training. Patient education is an essential nursing intervention which can influence patients' movement toward behavior change. Health care providers need knowledge to begin the

dialogue of change talk with their patients. Health coaching and motivational interviewing are two options to educate health care providers about initiating effective change talk.

Chapter Three

Project Design and Research Methodology

Initially, this project was designed to be a quasi-experimental study; it became evident during the recruitment process that a feasibility study would be the appropriate first step. .

Specific Aims of the Proposed Research

In the literature, perceived self-efficacy is closely related with behavioral intentions and health behavior change. The aim of this project was to evaluate the effectiveness of strategies designed to increase self-efficacy on smoking cessation rates. A feasibility study was designed to assess the effectiveness of strategies to increase self-efficacy and to assess their influence on smoking cessation rates.

Two outcomes were measured:

- A decrease or four-month point prevalence abstinence of tobacco
- Influence of self-efficacy strategies on smoking cessation rates

The self-efficacy promoting strategies used in this study included:

1. Motivational Interviewing by an advanced practice nurse who was a Certified Health and Wellness Coach and skilled at Motivational Interviewing.
2. Creation of short-term, achievable goals with the patient to develop confidence; success with minimal effort reinforces a strong sense of self-efficacy (Bandura, 1977).
3. Implementation of Bandura's two-step approach (Strecher, DeVellis, Becker, & Rosenstuck, 1986)
    - Ask patient if particular behavior can be accomplished,

- For each task have them rate the strength of his/her belief to accomplish the task.

Study Instruments

Three instruments were employed to collect data for this project.

Smoking self-efficacy questionnaire [SEQ-12] (Appendix C). The SEQ-12 is a 12-item scale which measures the confidence to refrain from smoking when faced with internal stimuli (like depression) and external stimuli (like being exposed to other smokers). The SEQ-12 was designed to measure the confidence of current and former smokers in their ability to abstain from smoking in high-risk situation. Etter, Gergman, Humair, and Perneger (2000) developed the SEQ-12 and have documented validity and reliability for this tool. "SEQ-12 fulfilled criteria of content, construct, and predictive validity, was highly reliable in test-retest procedures, had sound factorial structure, high internal consistency and not biased by social desirability" (Etter et al., 2000, p. 2).

Fagerstrom questionnaire (Appendix D). This tool is an eight-item questionnaire commonly used to estimate the degree of nicotine dependence in tobacco smoking that is often used in smoking cessation research.

Readiness to change scale (Appendix E). This scale helps to identify readiness for behavior change by ranking importance and confidence for behavior change on a 10-item scale ("1" = "not important or confident" and "10" = "very important or confident").

Subject Selection

Participants were recruited by two methods: self-referred or provider referred. All patients were provided information about the study at the time of their scheduled appointment in the existing smoking cessation program at the site of the study.

Participants were required to be 18 years of age or older. Pregnant and breast feeding women were excluded from this study due to the extra inconvenience of meeting the study requirements.

Study Procedures

Enrollment. A pre- post-test design and consecutive enrollment of participants to groups was utilized. All patients referred to the existing smoking cessation program at the site of the study were invited to participate. The study was introduced to the participant by an Advanced Practice Registered Nurse (APRN) who provided an opportunity to ask questions. The enlistment process met strict guidelines outlined by the site's Institutional Review Board (IRB) process and Health Insurance Portability and Accountability Act (HIPAA) guidelines. If the patient decided to participate, they signed an IRB approved consent form and were provided a signed copy.

Study process. Participants were consecutively enrolled into one of two groups. The first five participants received standard care from the current smoking cessation program and were identified as Group A (control group), and the next five participants received the current smoking program protocol plus additional strategies designed to support smoking cessation and were identified as Group B (intervention group)

Group A. Each patient had an individualized care plan created by the patient and advanced practice nurse as per the protocol for the smoking cessation program at the site facility. Components of the program can include:

- Care as usual; this care will not be influenced by the study procedures
- Physical exam and review of medical records
- Drug therapy
- Counseling or coaching

- Acupuncture
- Aromatherapy
- Stress management programs or tools
- Craving to Quit application

Group B. Includes regular care stated above plus the following:

- Provide strategies designed to increase self-efficacy,
- Use motivational interviewing. The advanced practice nurse used motivational interviewing skills learned in a program to be a Certified Health and Wellness Coach through Wellcoaches, Inc. The motivational skills are individualized for each participant based on the responses or feedback provided by the participant. Sample questions help to define motivational interviewing, as developed by Miller and Rollnick (2002), and are as follows (as cited in Moore, 2004):
    1. What do you want to know about quitting smoking?
    2. Do you want to set up some goals today?
    3. What small steps can you take to make that change? How often? When?
    4. How do you want to get here?
    5. What is your goal for today?
    6. What do you want?
    7. How can you change that?
- Create short-term, achievable goals to develop confidence; success with minimal effort reinforces a strong sense of self-efficacy
- Implement Bandura's two-step approach
    1. Ask the patient if particular behavior can be accomplished.

2. For each task have them rate the strength of his/her belief to accomplish task.

Definition of motivational interviewing. Miller and Rollnick (2002) define motivational interviewing as is a counseling methodology developed over the past 15 years in the addiction treatment field. MI is defined as a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence. This methodology considers what is necessary to initiate and support change-summarized briefly as being ready, willing and able-and uses a decisional balance sheet to consider the pros and cons of the status quo and change under consideration. Though a careful balance of inquiry and reflective listening, interviewers elicit and selectively reinforce pro-change talk, and respond to resistance in a way that is intended to diminish it (as cited in Moore, 2004).

The Advanced Practice Registered Nurse reviewed the medical record and conducted a physical examination for all enrollees. Review of this information is part of the routine visit for a patient/employee with the APRN for purposes of individualizing treatment. Information gained in the physical exam and medical record review was not included in the write up for this study.

Each participant was asked to complete four sessions. The first session was one hour; the next three sessions were 30-minute sessions scheduled at four weeks, eight weeks, 12 weeks and four months. Each participant was scheduled to complete three brief questionnaires at their first visit and at the 12 weeks visit. The three questionnaires were the Fagerstrom, the SEQ-12, and the Readiness to Change Scale. Each participant was told they would be contacted at four months by phone or email to provide a verbal response of their smoking status, whether a total cessation of tobacco related products or a reduction in the use of tobacco products since the start of the study.

Risk/Benefit/Safety

The risks for this study were limited. It was acknowledged that quitting smoking can be stressful for some patients and will vary from person to person, and this is related to weaning off nicotine. Therefore, a stressful response would likely happen regardless of participating in this study. When comparing the control and intervention groups, the effects of stress would be the same. There were no additional risks from engaging in motivational interviewing and strategies to increase self-efficacy.

Pre- and post-test studies using consecutive enrollment facilitate comparison of the effects of additional interventions to intervention group with usual care provided to control group. All participants received the current usual care. Also, the protocol had been designed to not over burden participants. The intervention was evidence-based to assure safety.

Monitoring and Reporting of Adverse Events

Continuous monitoring for adverse events (AE) was conducted by the APRN at each study visit. Adverse events constitute any negative change in health status or any undesirable experience associated with the study intervention reported by study participants. Serious adverse events (SAE) include death, disability, emergency evaluation or hospitalization. To maintain compliance with IRB standards, negative findings were required to be reported within 10 days. No negative findings were identified.

Statistical Analysis Plan

A pre- and post-test design was used to compare differences between the two groups. In a pre- post-test design all conditions are the same for the control and intervention groups, with the exception that the intervention group was exposed to additional intervention strategies, in this

study, interventions designed to increase self-efficacy. The independent variable was self-efficacy strategies and the dependent variable was smoking cessation.

The plan for statistical analysis was to compare results from questionnaires that all participants completed at baseline and at 12 weeks. The individual change scores for each participant would be calculated first and then the change scores would be summed for each Group. It was hypothesized that change scores on the SEQ-12 and Readiness to Change scale would be larger at 12 weeks and dependence on tobacco (as measured by the Fagerstrom Questionnaire), would be smaller at 12 weeks in Group B relative to Group A. Simple *t*-tests would be used to measure if there was a difference between the two groups on each of the three questionnaires.

Ethical Considerations

Approval for this study was obtained from on offsite Institutional Review Board (IRB) for the organization that was the site of the study. This offsite IRB operates in accordance with the ethical principles that have their origin in the Declaration of Helsinki and that are consistent with good clinical practice and applicable regulatory requirements.

Confidentiality

To provide confidentiality, no names were used on the documents in this study. Each participant was assigned a specific code. All documents were kept in locked cabinets only accessible to the APRN. Every effort was made to assure the confidentiality of all participants' records in this study.

Time Frame

Data were collected from February 2015 to September 2015. Data were analyzed in fall 2015 and reported in December 2015.

Summary

Several studies have examined the relationship between self-efficacy and smoking cessation. However, motivational interviewing was identified as a confounding variable which can positively influence both the dependent and independent variable. The use of motivational interviewing can provide an additional strategy for the APRN to support behavior change in their patients.

CHAPTER FOUR

Data Analysis

A feasibility study using a pre- and post-test design was utilized to answer the clinical question: *How does the implementation of strategies designed to increase a person's degree of self-efficacy impact smoking cessation rates in adult outpatient population when compared to traditional methods?* A total of ten patients agreed to participate in this feasibility study. All patients were provided with information about the study and offered an opportunity to ask questions prior to signing consent to participate. There was no random assignment and therefore participants did not have the same chance of being in the control or experimental group. A cut off score was assigned; the first five patients received standardized treatment and the next five patients received additional self-efficacy interventions. The goal was to identify whether there was increased quit rates in the five patients receiving the treatment; however, only three out of the ten patients followed through with the entire study. Due to the high dropout rate, a statistical analysis was unable to be completed. Data about participants' completion of the three questionnaires at study intervals are available. The study intervals were pre-study, 8 weeks and 12 weeks. The researcher called participants four months after their study date to secure self-report data including whether the participant had quit smoking. These data are portrayed in Table 1.

Table 1: *Documentation of Participants' Completion of Questionnaires*

Participant	Pre-Study	8 Weeks	12 Weeks	4 months	Quit
SC-A	X			X	X
SC-B	X	X			
SC-C	X				
SC-D	X	X			
SC-E	X				
SC-F	X	X			
SC-G	X				
SC-H	X				
SC-I	X				
SC-H	X				
SC-I	X				
SC-J	X				

Return on Investment

An added value of this project was a positive return on investment for the organization. Data were collected at the study site from April 1, 2013 to March 31, 2014 to evaluate smoking status and readmission rates. The Centers for Medicare and Medicaid Services (CMS) have mandated that hospitals with unplanned 30-day readmission after a patient is discharged from the hospital will not be reimbursed for those services. There were five medical conditions which were used to determine 30-day readmission rates. They were anterior myocardial infarction or AMI, heart failure or HF, pneumonia, chronic obstructive pulmonary disease or COPD, and stroke. The patient populations with AMI, HF, and pneumonia were analyzed in this data collection process.

After evaluating the data, it was determined that smoking is generally a contributing factor toward higher readmission rates. Even though the AMI does not follow the pattern identified, former smokers did have the highest readmission rate. It is one variable among many that helps to indicate a patient is at higher risk for readmission. The categories for *Smoking*

Status are listed as: current every day smoker, current some day smoker, former smoker, never assessed, never smoker, passive smoke exposure-never smoker, smoker, and current status unknown. The total number of patients identified as either in the current every day smoker category or current some day smoker category who had unplanned readmissions 30 days after discharged during the evaluation period is displayed in Table 2

Table 2: *Smoking Status of Diagnosed Acute Myocardial Infarction, Heart Failure, and Pneumonia Patients with Unplanned 30-Day Readmissions, April 1, 2013-March 31, 2014*

Diagnosis	Current Every Day Smoker	Current Some Day Smoker	Total
AMI	27	4	31
HF	39	7	46
Pneumonia	26	4	30
Total	92	15	107

The total number of AMI, HF and pneumonia patients who were discharged between April 1, 2013 and March 31, 2014 who were a current every day smoker or current some day smoker is displayed in Table 3.

Table 3: *Total Discharges of Diagnosed Acute Myocardial Infarction, Heart Failure, and Pneumonia Patients with Unplanned 30-Day Readmissions, April 1, 2013-March 31, 2014*

Diagnosis	Current Every Day Smoker	Current Some Day Smoker	Total
AMI	449	43	492
HF	202	38	240
Pneumonia	207	15	222
Total	858	96	954

Tobacco use is the single most preventable cause of death and disease in the United States (Clearway Minnesota, 2011). The average quit rate for smokers that don't use medications or counseling is 4-7% (American Cancer Society [ACS], 2014). In the *Minnesota Adult Tobacco Survey 2010 Update,* the return on investment was higher for employers when a compare and contrast was done for managing a single care of heart failure. The cost of treating a single case of

heart failure was estimated at $5.23 per member per month [PMPM] (Clearway Minnesota, 2011). A smoker costs a private employer in the United States an extra $5,816 per year compared with a nonsmoker (Egan, 2013). The largest cost, at $3,077 annually, came from taking smoking breaks (Egan, 2013). The second largest cost, $2.056, was related to excess health care expenses (Egan, 2013). Smokers typically have more health problems than nonsmokers, including heart and lung disease and various cancers (Egan, 2013).

A return on investment was calculated comparing the cost of adding the strategies designed to increase self-efficacy to the existing site program against the costs of a smoker to a private employer over one year. The budget for this program is illustrated in Table 4, costs avoided in Table 5, and the return on investment in Table 6. The benefit to cost ratio was calculated as positive so the project was deemed acceptable.

Table 4: *Costs to Implement Smoking Cessation Feasibility Study*

Financial Costs	Estimates for 74 Participants Unless Otherwise Indicated
Salaries	
• Advanced Practice Nurse	$83,200[a]
• Clinical Assistant (Salary to be Divided among several providers	$33,280[b] (Salaries will not be included because they aren't an added expense)
Variable Costs	
• Cost of paper for patient education booklet	$66.60[d]
• Cost of ink for printing booklet	$407.89[e]
• Cost for IRB submission	$2340
• *Health Journey Stop Smoking Meditation* CD @ $17.09 each	40 participants x $17.98 = $719.20
Program Marketing Costs	$6
Office Operations	NA
Total	$3,533,69

Note.[a] $50 per hour includes benefits, eight hours, four days per week seeing patients in clinic, $50 x 8=$400 per day, calculate $400 x 4 days x 52 weeks per year.

[b] 20 per hour includes benefits, eight hour, four days per week assisting in the clinic, calculate $20 x 8=$160 per day.

[d] cost of paper : $06 per sheet, each patient booklet is 15 pages, 15 x .06=$.90, $.90 x 74 patients.

[e] average cost for an ink cartridge=$60.88, one cartridge will print (HP 121 Tri-color Ink Cartridge 165 standard pages (with HP 121 Black Ink Cartridge), can print 11 patient manuals on one ink cartridge, will need 9 cartridges x $60.88 each.

Table 5: *Costs Avoided Per Year*

Costs of Smoker	Total Smokers for AMI, HF and Pneumonia	4-7% Will Quit Without Support	Total Smokers Potentially Impacted by Smoking Cessation Strategies
$5,816	107	107-5.35=101.65	101.65 x $5,816
Total			$591,196.40

*Note.**(Egan, 2013)

Table 6: *Financial Worksheet for the Additional Smoking Cessation Strategies Program for 12 Months*

Program Total Costs	$47 per person x 101.65 people =$4,777.55
Costs Avoided	$5,816 x 101.65 = $591,196.40
Difference	$586,418.85
Return on Investment	$12,274.48

Note. Return on Investment (ROI) =total benefits/total costs. Return on Investment (ROI): ROI= (total benefits-total costs)/total costs x 100. Project deemed acceptable if benefits are greater than costs: Benefit-cost ratio>1, ROI is positive. (Rhoads, [PowerPoint], 2013).

Summary

Though a causal relationship was established in the literature between increased self-efficacy and higher rates of smoking cessation; in this study, a threat to internal validity existed and impacted the dependent variable. The threat to internal validity was hypothesized to be a social threat; because when social research is conducted in the real-world where people can react to not only what affects them but also others around them. Often people smoke to help control stress because chemicals released in the brain create an increased sense of well-being. If individuals trying to quit smoking enter back into a high risk situation, it is less likely they will be able to sustain smoking cessation.

Chapter Five

Recommendations

The goal of this study was to identify and evaluate new strategies to add to a traditional smoking cessation program to increase smoking cessation rates in an adult outpatient population. If the new strategies positively impact smoking cessation rates, they would be applied at the inpatient level with the goal of impacting hospital readmission rates. There are many physical and psychological influences which can impact cessation. Since there was a causal relationship identified between high degrees of self-efficacy and improved smoking cessation rates, a feasibility study was created to test this relationship. However, a lack of follow- up by the study participants made it impossible to compare the pre and posttest results.

Recommendations

The recommendations for future studies are based on lessons learned from this project. Recommendations are supported by the two theoretical frameworks which guided this project. The theory of self-efficacy by Bandura (1977), describes the importance of having confidence to cope with high-risk situations without relapse, and the Stages of Change Theory by Prochaska and Diclemente (1983) describes how people modify a problem behavior or acquire a positive behavior through the Stages of Change model, occurring over time. A high degree of self-efficacy helps an individual to progress through the stages with less relapse. The intention of this project was to provide the skills and incentives which would increase a person's level of self-efficacy in order to support their quit attempt especially in stressful situations. What was learned during data collection and patient communication and follow-up was a need for greater rigor.

The best way to impact smoking cessation rates per the TTM model is to put more focus on the assessments of outcomes. Interventions can be evaluated in terms of their impact, but having a higher recruitment, combined with high efficacy will best impact individuals and populations with a behavioral health risk. Three recommendations are posed:

1. *Identify more rigorous guidelines for data collection and patient follow-up.* Despite the reinforcement of required intervals for subsequent visits, follow-up was poor. It was the researcher's ethical responsibility to approach each participant in non-coercive or punitive way; however, building into the study a phrase stating, "We need to identify a time that I can call you, one day per month". This approach would provide a structure for a more rigorous health coaching to identify barriers which limit successful smoking abstinence. Further, adding that the researcher would send reminder letter or emails to participants who did not complete assessment questionnaires as scheduled.
2. *Put more structure to making behavior change happen.* Patients may be unable to sustain changes when confronted with life's challenges if they feel overwhelmed by life's demands. It is crucial to address the cognitive and behavioral processes that lead people to smoke. Perhaps these challenges could be addressed more effectively in a group setting. Bandura's Social Learning Theory stresses the importance of observational learning, imitation and modeling. Providing a group medical visit or support group to address smoking cessation, may help to create a community environment and provides a platform for patients to ask questions and learn from one another about their experiences.
3. *Educate health care providers to initiate change talk with their patients*. The TTM model states that interventions for smoking cessation should be evaluated in terms of the impact on entire populations of individuals with behavioral health risks. The TTM model

has the potential to have both a high efficacy and a high recruitment rate, thus impacting populations more. Health care providers are important part of behavior change. They have the ability to impact populations with behavioral health risks just by creating change talk with their patients and supportive interventions. Health care providers can be taught how to initiate change talk by watching an educational video. Watching this video could be provided by the organization, as part of the yearly education and compliance requirements. Providers will learn how to explore patient values, identify social support strategies for obstacles, increase confidence, and put a plan in place for triggers, thereby empowering patients to more effectively "self-manage" their health condition.

Summary

Nicotine found in tobacco is a highly addictive substance making it difficult for users to quit. Identifying the factors that can limit successful smoking abstinence is crucial. Evidence-based practice guidelines for smoking cessation are available and can help guide practice. In the literature, a causal relationship was found between high levels of self-efficacy and improved smoking cessation rates. A feasibility study was attempted to test this relationship which included health coaching, motivational interviewing and strategies designed to increase a patient's degree of self–efficacy, however, due to lack of follow-up by study participants the results were unavailable. In regards to future studies in this area, the positive influence of motivational interviewing and self-efficacy on each other has been identified. The advanced practice nurse can use this knowledge to help support behavior change in their patients. Since behavior change occurs over time, establishing more rigorous methods for patient accountability and follow-up is recommended. Patient accountability may be influenced in a positive way if change talk begins with their medical provider. Educational videos containing information about

how to initiate change talk can provide the education for medical providers in need of knowledge to begin this process with their patients, encouraging them to stay engaged and prevent relapse.

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APPENDIX A

Levels of Evidence

Levels of Evidence

Level 1 - Systematic review & meta-analysis of randomized controlled trials; clinical guidelines based on systematic reviews or meta-analyses

Level 2 - One or more randomized controlled trials

Level 3 - Controlled trial (no randomization)

Level 4 - Case-control or cohort study

Level 5 - Systematic review of descriptive & qualitative studies

Level 6 - Single descriptive or qualitative study

Level 7 - Expert opinion

Note: Melnyk, B.M. & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing and healthcare: A guide to best practice.* Philadelphia: Lippincott, Williams & Wilkins.

APPENDIX B

Grades of Recommendations

Grades of Recommendations:

A	Directly based on Level I evidence
B	Directly based on Level II evidence or extrapolated recommendations from Level I evidence
C	Directly based on Level III evidence or extrapolated recommendations from Level I or II evidence
D	Directly based on Level IV evidence or extrapolated recommendations from Level I, II, or III evidence

Note: Secured from Shekelle, Woolf, Eccles, Grimshaw, & West, 1999 (as cited in University of Minnesota, 2015)

APPENDIX C

SEQ-12 Questionnaire

Smoking Self-Efficacy Questionnaire (SEQ-12)
The following are some situations in which certain people might be tempted to smoke. Please indicate whether you are sure that you could refrain from smoking in each situation using one of the following answers:
1 = Not at all sure 2 = Not very sure 3 = More or less sure 4 = Fairly sure 5 = Absolutely sure
1. When I feel nervous _____
2. When I feel depressed _____
3. When I am angry _____
4. When I feel very anxious _____
5. When I want to think about a difficult problem _____
6. When I feel the urge to smoke _____
7. When having a drink with friends _____
8. When celebrating something _____
9. When drinking beer, wine, or other spirits _____
10. When I am with smoker's _____
11. After a meal _____
12. When having coffee or tea _____

Note. Etter, J., Bergman, M.., Humair, J., & Perneger, T. (2000). Development and validation of a scale measuring self-efficacy of current and former smokers. *Addiction, 95*(6), 901-913.)

APPENDIX D

Fagerstrom Questionnaire

Fagerstrom Test for Nicotine Dependence

Is smoking "just a habit" or are you addicted? Take this test and find out your level of dependence on nicotine.

1. How soon after you wake up do you smoke your first cigarette?

¨ After 60 minutes (0)

¨ 31-60 minutes (1)

¨ 6-30 minutes (2)

¨ Within 5 minutes (3)

2. Do you find it difficult to refrain from smoking in places where it is forbidden?

¨ No (0)

¨ Yes (1)

3. Which cigarette would you hate most to give up?

¨ The first in the morning (1)

¨ Any other (0)

4. How many cigarettes per day do you smoke?

¨ 10 or less (0)

¨ 11-20 (1)

¨ 21-30 (2)

¨ 31 or more (3)

5. Do you smoke more frequently during the first hours after awakening than during the rest of the day?

¨ No (0)

¨ Yes (1)

6. Do you smoke even if you are so ill that you are in bed most of the day?

¨ No (0)

¨ Yes (1)

Fagerstrom Test for Nicotine Dependence (cont.)

Your score was:_____

Your level of dependence on nicotine is:

0-2 Very low dependence 6-7 High dependence

3-4 Low dependence 8-10 Very high dependence

5 Medium dependence

Scores under 5: "Your level of nicotine dependence is still low. You should act now before your level of dependence increases."

Score of 5: "Your level of nicotine dependence is moderate. If you don't quit soon, your level of dependence on nicotine will increase until you may be seriously addicted. Act now to end your dependence on nicotine."

Score over 7: "Your level of dependence is high. You aren't in control of your smoking – it is in control of you! When you make the decision to quit, you may want to talk with your doctor about nicotine replacement therapy or other medications to help you break your addiction."

Note. Heatherton, T., Kozlowski, L., Frecker, R., Fagerstrom, K. (1991). The Fagerstrom test for nicotine dependence: A revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addictions, 86*:1119-27

APPENDIX E

Readiness to Change Questionnaire

Readiness to Change Exercise

Name _____ Date_____

This exercise will help you understand how ready you are to change certain behaviors related to your health and wellbeing. The answers will help your coach determine what areas of your health are most important, as well as help you set realistic goals. Please do not judge your answers, just try to be as truthful as possible. There is no right or wrong answers.

In the first column, rank, on a scale of 1-10 how important the following behaviors are to you (1 = not important at all and 10 = very important). If the behavior is not applicable (i.e. you do not smoke), just write "NA' in the box. Keep in mind; something can be important to us, even if we struggle to change the behaviors. If you think about something often, chances are it is important to you.

In the second column, rank, on a scale of 1-10 how confident you are that you can **make and maintain** changes in these areas ("1" = "not confident at all" and "10" = "very confident/already part of my lifestyle").

BEHAVIOR	IMPORTANCE	CONFIDENCE
Reduce/Cease Smoking		
Weight management		
Physical activity		
Nutrition		
Stress management		
Medication compliance (you take your medications as prescribed)		
Sleep		

1 = not important 1 = not confident

10 = very important 10 = very confident

NA = not applicable

Your coach will discuss this with you more at your initial appointment.

Note. Based on the Readiness to Change grid by Wellcoaches (2014)