BEST PRACTICES IN TOBACCO CESSATION IN RURAL POPULATIONS

By

LEAH GRACE GAWIN

_____

A Thesis Submitted to The Honors College

In Partial Fulfillment of the Bachelors degree

With Honors in

Nursing

THE UNIVERSITY OF ARIZONA

MAY 2019

Approved by:

_____

Dr. Melissa Goldsmith
College of Nursing

Abstract

The purpose of this thesis is to develop best practice recommendations to provide tobacco cessation to rural populations. Recommendations for best practice will be developed from evidence-based research within the last ten years. Tobacco addiction is still a problem in America and tobacco cessation interventions are needed to fight this epidemic. Tobacco use accounts for six million deaths per year and is the leading cause of preventable death (Petersen et al., 2017). Rural communities are behind the national average in tobacco cessation. In 2009, the prevalence of smoking was 26% in rural areas which was similar to the national average in 1990 (Mussulman et al., 2014). Rural communities lack adequate medical access, insurance coverage, cell phone access for quitlines and tobacco cessation education. In addition, rural areas have a higher prevalence of low socioeconomic status and tobacco is socially more accepted in these areas (Weg et al., 2016). Education is a powerful tool in the implementation of tobacco cessation interventions, and if used in the clinical setting can improve patient outcomes. If nursing programs were to include tobacco cessation in the curriculum, nurses would have a greater impact on the fight against tobacco use especially in rural communities.

CHAPTER 1

Introduction

Statement of Purpose

The purpose of this thesis is to develop best practice recommendations to provide tobacco cessation to rural populations and provide cessation training to nurses. Recommendations for best practice will be based on evidence published within the past ten years.

Background of Issue Importance

Tobacco addiction is still a problem in America and tobacco cessation interventions are needed to fight this epidemic. Tobacco use accounts for six million deaths per year and is the leading cause of preventable death (Petersen, Meyer, Sachs, Bialous, & Cataldo, 2017). Currently 16.8% of Americans use tobacco products and 480,000 Americans will experience preventable premature tobacco death each year (Petersen et al., 2017). Over 16 million Americans have at least one disease caused by tobacco and this amounts to 170 billion dollars in medical expenses (Centers for Disease and Prevention [CDC], 2018). In Arizona, 14.6% of population reported using tobacco in 2016 (CDC, 2018). On average 8,300 people die from tobacco related diseases in Arizona and in 2009, 2.4 billion dollars was spent on medical costs related to tobacco caused illnesses (CDC, 2018). Tobacco use contributes to several medical diseases including stroke, lung and throat cancer, and coronary artery disease (CDC, 2018). Tobacco use has declined since 1964 due to multiple efforts done by state and federal government laws. The CDC implemented Healthy People 2020 in December 2010 to improve the overall health status of Americans. Healthy People 2020 has taken steps towards reducing the national tobacco average through three national goals: implementing policies to reduce tobacco use, adopting policies to increase the price and availability of tobacco products, and establishing

policies to reduce environmental exposure to secondhand smoke (U.S. Department of Health and Human Services [USDHHS], 2018). Arizona has decreased its tobacco use through telephone quitlines, comprehensive smoke free laws including smoke free zones in business areas and hospitals, and tobacco free university campuses (CDC, 2018).

Tobacco cessation and prevention programs have greatly reduced the amount of tobacco use but there is still work to be done. By the year 2030, it is estimated that eight million people will die each year from tobacco related deaths (Petersen et al.,2017). Furthermore, rural communities are behind the national average in tobacco cessation. In 2009, the prevalence of smoking was 26% in rural areas which was similar to the national average in 1990 (Mussulman et al., 2014). Rural communities lack adequate medical access, insurance coverage, cell phone access for quitlines and tobacco cessation education. In addition, rural areas have a higher prevalence of low socioeconomic status and tobacco is socially more accepted in these areas (Weg et al., 2016). Due to poor medical access, rural populations tend to be diagnosed in later stages of cancers with poorer outcomes (CDC, 2018). Education is a powerful tool in the implementation of tobacco cessation interventions, and if used in the clinical setting can improve patient outcomes. The U.S. Public Health Clinical Practice Guideline for *treating tobacco use and dependence 2008 update* recommends treating tobacco dependence as a chronic disease and health care professionals should address tobacco dependence (Petersen et al.,2017). The "5 A's and 5 R's" were created to help healthcare professionals address tobacco addiction with patients. The 5A's address five major tobacco addiction intervention steps: Ask, Advise, Assess, Assist and Arrange. The five R's address steps to take with patients who are ready to quit: Relevance, Risks, Rewards, Roadblocks and Repetition (Petersen et al, 2017). Health care professionals

play an important role in teaching tobacco cessation techniques and overcoming tobacco addiction in rural communities.

Significance of the Problem (to Nursing)

Nurses are the largest group of healthcare professionals worldwide and have potential to educate patients on the negative effects of tobacco. They are the frontline of healthcare and have the most patient interaction. According to the annual Gollop poll on honesty and ethical standards, for the last 17 years nursing has topped the list of 22 professions and is the most trusted healthcare profession (Brenan, 2018). Article 14 of the WHO framework on Tobacco Control states tobacco cessation should be incorporated into all training curriculum for healthcare professionals (Petersen et al., 2017). The American Nurses Association (ANA) states that nurses have the ability to implement tobacco cessation interventions effectively and reduce tobacco use (Rice et al., 2017). Furthermore, the ANA states nurses must be equipped with the essential skills to prevent tobacco use and implement nurse led tobacco cessation interventions to meet the Healthy People 2020 goal of 12% tobacco use in America (Rice et al., 2017). In 2011, the CDC found that approximately 80% of smokers are seen by healthcare professionals each year yet only 48.3% of those patients are advised to quit (Petersen et al., 2017). The lack of nursing tobacco cessation interventions can be attributed to the lack of education in nursing programs, limited knowledge by the professors, lack of time with patients and lack of resources (Petersen et al., 2017; Whitehead et al., 2014). In addition, nurses lack the confidence to implement these interventions with patients in clinics, especially staff nurses. Tobacco education needs to be continually taught and reinforced in healthcare organizations along with nursing programs to allow nurses to be more comfortable with the topic (Heath et al.,2017; Petersen et al.,2017). There is also a need to adapt nursing interventions for low socioeconomic patients that

suffer tobacco addictions to improve patient outcomes (Sheffer *et al.*, 2017). Nurses and general physicians are equally qualified to implement interventions and statistically are equally as effective (Rossem et al.,2017).

Summary

The tobacco epidemic in America has led to millions of deaths, chronic diseases and healthcare costs. Rural communities are most at risk for tobacco abuse due to lack of healthcare access and amenities. Nurses are the most trusted profession and have the potential to make an impact in the tobacco epidemic, especially in rural communities where healthcare is lacking. It is within the scope of practice of a registered nurse to advice patients to quit smoking, and nurses should be trained to do so. Tobacco cessation education needs to be incorporated into nursing training to combat the tobacco crisis especially in rural communities.

CHAPTER 2

Review of Literature

Chapter two addresses a review of literature on current nurse tobacco cessation programs, current nurse tobacco cessation practices, and current tobacco cessation programs in low socioeconomic populations. Several databases were utilized to select articles for this literature review. The data bases include Cochrane review, CINAH, Elsevier, and PubMed. In order to narrow the search of the literature key words were used. The key words used for this review were, “Tobacco,” “Nursing and Tobacco”, “Tobacco Cessation” and “Tobacco and Low Income”. The following fifteen articles have been published within the last five years (2012-2017) and have been published in scholarly journals to maintain a credible status. This literature review will review several different types of research studies such as qualitative, randomized qualitative, descriptive, randomized control trials and meta-analysis of randomized control trials.

Nurse Education Programs on Tobacco Cessation

Petersen et al. (2017) conducted a quantitative study that implemented tobacco cessation curriculum in Loma Linda University’s nursing program to address the lack of tobacco cessation nursing interventions in the clinical setting. The researchers stated that practicing nurses and nursing students exhibit minimal knowledge, skills, and confidence required to implement tobacco cessation nursing interventions in the clinical setting (Petersen et al., 2017). The researchers addressed this concern by implementing a curriculum plan with the faculty. Purposive and convenience sampling were used. The faculty were recruited via email announcements forty-two faculty (77% undergraduate programs and 23% graduate programs) members were given a base-line survey for knowledge assessment (Petersen et al., 2017). The survey findings were used to develop education goals for the one-year mark, redesign the

curricula, and develop tobacco cessation teaching workshops for faculty. Education goals were evaluated at the one-year mark and the curriculum was reviewed at the end of the second year. A post-survey was administered to the faculty at the end of the two years. Surveys were administered through Survey Monkey and were analyzed through SPSS Version 19 (Petersen et al., 2017). The baseline survey results showed that 41.5% of faculty reported no previous knowledge in tobacco dependence treatment and 48.8% of faculty reported no experience in tobacco dependence (Petersen et al., 2017). In addition, the post survey showed increased awareness of tobacco curriculum being taught (53.7%-81%), student interventions used (17.1%-42.5%) and co-faculty members with previous tobacco cessation experience (36.6%-71.4%) (Petersen et al., 2017). Between the undergraduate and graduate programs, the nurse practitioner program increased the amount of clinical training skills the most (0-6 hours) (Petersen et al., 2017). There were no changes in the mean confidence in regard to tobacco related skills, but changes in attitudes towards patients with tobacco addictions (Petersen *et al.*, 2017). The researchers noted that lack of time, not knowing where to implement tobacco cessation into the curriculum, lack of experience and lack of clinical agencies were barriers to teaching tobacco related curriculum and for future curriculums. The study was limited to the one university which resulted in a small sample size.

A quantitative study by Whitehead et al. (2014) focused on tobacco cessation curriculum in nurse practitioner programs to increase perceived confidence in implementing smoking cessation information. The purpose of this study was to see if an education program based on the Rx for Change Theory-a standardized curriculum based on the Clinical Practice Guideline for treating Tobacco, would increase Advanced Practiced Registered Nurse (APRN) student's knowledge, skills, and confidence in tobacco cessation interventions (Whitehead et al., 2014).

The researchers utilized convenience sampling for APRN students enrolled in Master of Nursing (MSN) Family Nurse Practitioner Program in South Florida (Whitehead et al.,2014). The sample size of this study was 36 students out of a class of 40 students (Whitehead et al., 2014). The students were given a pre-and post-survey to assess tobacco cessation perceived confidence and education and an online tobacco educational program. Paired *t*-tests were used to analyze pre-and post-surveys and the 20-question survey with a Cronbach's alpha coefficient of .81 (Whitehead et al., 2014). The mean knowledge on the pre-survey was 9.77 and post-survey was 17.47. The mean confidence on the pre-survey was 16.41 and post- survey was 39.36 (Whitehead et al.,2014). There was a statistically significant increase in participant's perceived knowledge and confidence in tobacco education (Whitehead et al., 2014). Weaknesses of the study that potentially limited it were its small sample size and two students reported to be in the current recovery stage from tobacco addictions. Restraints in tobacco cessation curriculum in nursing programs include lack of time, lack of resources, lack of faculty, and lack of institutional support.

Kralikova et al (2016) conducted a single group design study analyzed the effect an online educational program on tobacco had on Czech Republic nurses. The researchers used convenience sampling to recruit nurses in the Czech Republic by advertising at nursing seminars and on nursing websites. Pre-surveys were administered online followed by an E-learning (online) program that included the role of nursing in tobacco cessation and smoking cessation within oncology settings (Kralikova et al., 2016). The participants were asked to complete a post survey three months following the educational program. The researchers recruited 279 participants. In order to be included in the study, both pre-and post-surveys had to be completed (Kralikova et al, 2016). The data from the surveys was analyzed using SAS 9.4 to describe

demographics and outliers, and intervention changes were analyzed by Generalized Linear Mixed Model (Kralikova et al., 2016). The researchers concluded from the surveys that participants increased their rate of asking patients about tobacco habits from pre-to post- survey from 56-66%, assessing willingness to quit 49%-63%, and recommendations to cease smoking habits from 21% to 33% (Kralikova et al., 2016). Overall, the nurses' brief tobacco cessation intervention skills improved following the e-course, even though some reservations remained (Kralikova et al., 2016). Continued nurse education will contribute to better nurse tobacco cessation interventions.

Tobacco Cessation Knowledge of Nurses in the Clinical Setting

A descriptive correlational study by Heath et al (2017) identified the relationships between the 5 A's (ask, advise, assess, assist, and arrange), the effect individual and organizational characteristics of excellence have on tobacco cessation interventions, and the nurses' intentions to implement tobacco cessation interventions as daily care. The researchers recruited nurses from the Association of Critical- Care Nurse (AACN) at the National Teaching Institute in Boston, Orlando and Chicago over a three-year period. Nurses were recruited via convenience sampling and were asked to participate in ten-minute online survey to be put in a raffle for a gift card. The researchers collected 1,773 surveys that met the inclusion criteria (Heath et al., 2017). The study sample included a multitude of different hospitals and organizations. The survey was a 21-item instrument that was based off of the Theory of Reasoned Action with a Cronbach alpha of .71 (Heath et al., 2017). The data was examined using the SPSS version 22 for missing data and outliers (Heath et al., 2017). The researchers found that nurses from organizations with standing orders for tobacco interventions were five times more likely to have confidence in 5 A's Skills ($P < .001$) than from organizations that did

not (Heath et al., 2017). In addition, staff nurses and nurses without certification in acute care had lower levels of confidence in implementing tobacco cessation compared to managers, educators, researchers, and advanced practice nurses (P= .04) (Heath et al., 2017). Nurses with high levels of confidence in 5 A's (specifically the assess part) were four times more likely to integrate tobacco cessation interventions into daily care (odds ratio, 4.280; 85% CI, 1.380-13.270; P=.01) (Heath et al., 2017). Organizational status of Magnet and/or Beacon did not yield statically significant results (Heath et al., 2017). Although nurses from a Beacon status work environment were 1.5 times more confident in their ability to assist in tobacco cessation, which is clinically significant (Heath et al., 2017). Weaknesses of the study included gender bias and had a limited sample size, 91% of survey participants were female and the study was limited to only nurses that attended the conference (Heath et al., 2017).

Effectiveness of Nursing Smoking Cessation Counseling

A pragmatic randomized, two-group controlled trial by Rossem et al (2017) studied the effectiveness of counseling by a practiced nurse (PN) versus brief advice of a general practitioner (GP) both combined with pharmacotherapy and six months tobacco abstinence as the primary outcome. For the secondary outcome, the researchers measured the patients' 12-month abstinence, medication adherence, and incremental costs per life-year gained (Rossem et al., 2017). The researchers used a network of primary healthcare settings in the Netherlands that covered over 65,000 patients (Rossem et al., 2017). It was a multi-site trial that covered ten clinics and the researchers used purposive sampling to recruit 149 practice nurses and 146 general practitioners (Rossem et al., 2017). In addition, they used purposive sampling to recruit 295 adult smoking patients. A power analysis was conducted to calculate a minimum of 136 patients per group. The patients were randomly assigned 1:1 ratio using computer sequences.

The PN group participants were offered several face to face or telephone meetings to implement tobacco cessation while the GP group participants were required a minimum of one visit (Rossem et al, 2017). The researchers concluded that both PN and GP were equally effective in tobacco cessation education (Rossem et al., 2017), but the GP group had higher abstinence rates (abstinence rate of PN versus GP was 32.2% versus 39% from weeks 9-26, and 25.5% to 28.8% from weeks 9-52) (Rossem et al, 2017). In addition, GP had better dosing adherence to varenicline compared to the PN group (GP 62.0% compared to PN 45.5%) (Rossem et al., 2017).

Researchers Rice, Heath, Livingstone-Banks, & Hartmann-Boyce (2017) conducted a meta-analysis of 58 articles studying the effectiveness of nursing initiated and delivered tobacco cessations interventions in adults compared to no intervention. In addition, they studied the effectiveness of a more intensive intervention approach compared to a minimal intervention approach, the setting of interventions, the effectiveness of follow-ups and if aids that demonstrated the pathophysiological effect of smoking were more effective compared to no aids (Rice et al., 2017). Two review authors analyzed the data separately. The main outcome that was studied was abstinence from tobacco products for at least six months from the initial intervention in follow-up(Rice et al., 2017). The researchers utilized the Mantel-Haenszel fixed-effect model to report the outcomes. The exclusion criteria included less than six-month follow-up, nursing interventions compounded with additional pharmacological or behavioral treatment and no pregnant women. The researchers defined a “nursing intervention” as advice, counseling or strategies to help patients quit smoking (Rice et al., 2017). The results found that a nurse led intervention increased the likelihood of quitting compared to no quitting (Rice et al., 2017). The researchers judged the quality of this evidence to be moderate due to statistical heterogeneity (Rice et al., 2017). They found that high-intensity interventions, additional demonstration aids,

additional follow-ups provided no evidence that they increase the likelihood of quitting compared to minimal intensity interventions, no demonstration aids, and no additional follow-ups (Rice et al., 2017). There was no evidence that patient setting impacted the effectiveness of the intervention (Rice et al., 2017). A limitation of this was that the research was considered moderate evidence and that further in-depth research could change the confidence of the results. This research is applicable to this thesis because it shows that nurses have the ability to make an impact in tobacco cessation quit rates.

Tobacco Cessation Programs in Low Socioeconomic Populations and Rural Areas

Tall, Brew, Saurman, & Jones (2015) conducted a qualitative study was to explore the experiences of primary healthcare staff involved in implementing an anti-smoking campaign in rural Australia. Tall et al used a phenomenological approach to assess the challenges and strategies of an anti-smoking program in rural areas. The researchers conducted semi-structured interviews and focus groups with primary health care staff involved in the start of anti-smoking programs in rural Australia between 2008-2010 (Tall et al., 2015). The staff included general practitioners, case managers, and service managers. There were eight healthcare service managers interviewed from the time of 2008-2010 and none participated in focus groups (Tall et al., 2015). The two general practitioners were interviewed from 2008-2010 and a total of nine involved in the focus groups (Tall et al., 2015). There was a total of five case managers interviewed from 2008-2010 and a total of 56 in focus groups (Tall et al., 2015). The data was collected using the semi-structured interview approach and focus groups throughout a three-year period (2008-2010) (Tall et al., 2015). The researchers concluded that the following were barriers to tobacco cessation in the rural clinics; limited primary and mental healthcare resources, limited client access to improvement services, limited teamwork between health services,

difficulty of staff training and assessing training, normalization of tobacco use in the community, socioeconomic level of the community, community distress, and low morale of the health care staff (Tall et al., 2015). The researcher's identified the following as strategies to overcome such challenges; appointing tobacco-dedicated staff; improving health service collaboration, access and flexibility; providing subsidized pharmacotherapies and boosting staff morale (Tall et al., 2015). A weakness of this study included a small sample size due to limited staff from rural areas. Rural areas are a unique from metropolitan areas, especially in healthcare. This study helped addressed ways to overcome known barriers to tobacco cessation in rural communities and the attitudes of rural healthcare staff.

Tobacco Cessation Interventions

Sheffer et al. (2017) conducted a randomized control trial that attempted to reduce the socioeconomic disparities in treatment for tobacco cessation of diverse lower socioeconomic smokers by examining the effectiveness of a tailored treatment. The researchers recruited 227 participants from New York City (Sheffer et al., 2017). The inclusion criteria included that the participants had to be at least 18 years old, make less than $15,000 per year on average, and meet demographic criteria for race, ethnicity and location (Sheffer et al., 2017). Two groups were randomized by the study coordinator and friends and family were kept in the same group to reduce cross contamination. The participants received one-hour treatment sessions for six weeks of either the standard or adapted treatment specialists. The sessions included quit days and eight weeks of 24-hour nicotine patches. The researchers found that systematic adaption of evidence-based treatment for tobacco cessation improved short term treatment goals and reduced relapse rates (Sheffer et al., 2017). In addition, the adapted treatment reduced the days to relapse for the two lowest socioeconomic subgroups (Sheffer et al., 2017). Interactions between socioeconomic

status and conditions were significant for initial abstinence and not for six-month abstinence (Sheffer et al., 2017). There were no significant differences in long term abstinence (Sheffer et al., 2017). This research study is beneficial to the healthcare field because it highlights the effects socioeconomic status has on addiction recovery and how future health care providers can combat this.

Vander Weg et al. (2016) conducted a randomized control pilot study to determine the feasibility and efficacy of individually-tailored tobacco cessation interventions for rural veteran smokers. In addition to individually-tailored tobacco intervention counseling, Vander Weg et al. (2016) also addressed other comorbidities that could interfere with quitting such as depressive symptoms, risky alcohol use and weight gain. Convenience sampling was used to recruit veteran participants from Midwestern Veterans Association Hospital health records. The authors identified 847 potential participants from the health records and mailed recruitment letters to 706 veterans (Vander Weg et al., 2016). Vander et al. (2016) utilized 63 veterans and randomly divided the participants into two groups; Tailored group (n=31) or Quitline group (n=32). Participants were enrolled in the trial from June to November 2012 (Vander Weg et al., 2016). The tailored intervention consisted of individually tailored treatments to help abstain from tobacco use. These interventions included tailored tobacco management, mood management, alcohol risk reduction, weight management and pharmacotherapy (Vander Weg et al., 2016). The Quitline group was referred to the state's tobacco quitline for assistance (Vander Weg et al., 2016). Vander Weg et al. (2016) measured the outcomes with self-reported prevalence of tobacco use. The primary outcome was self-reported 7-day abstinence at 12 weeks and 6 months following the participants target quit days (Vander Weg et al., 2016). The self-reported 12 week quit rates were 39% for the tailored group and 25% for the quitline group (Vander Weg et al.,

2016). The 6 month quit rates were 29% for the tailored group and 28% for the quitline group (Vander Weg et al., 2016). The treatment satisfaction for the category of "extremely useful" was 74% for the tailored group and 46% for the quitline group (Vander Weg et al., 2016). They found that 86% of the tailored group participants liked that the tailored interventions addressed multiple issues (Vander Weg et al., 2016). The odds ratio of quitting was 90% higher in the tailored group at 12 weeks and there was no difference at the 6-month mark (Vander Weg et al., 2016). The authors concluded that the tailored group was able to address multiple comorbidities and satisfaction with the tailored tobacco intervention was high. This randomized trial addressed the difference between an individually tailored treatment and quitline treatment. Individual tailored treatments would be ideal for every patient, but this is not feasible. This study concluded that quit rates at 6 months following the two treatment plans did not differ much. Telephone quitlines are able to reach more patients at reduced costs compared to individually tailored treatments addressing multiple comorbidities.

Sheffer et al. (2015) purpose of this qualitative study was to assess the barriers to quitline cessation interventions in the Arkansas Mississippi delta region. The Arkansas Mississippi region is known to have a low socioeconomic population in rural areas. This study was a second phase to a larger community-based project. The first phase was a community-based participatory approach to conduct a qualitative study of the barriers to quitlines (Sheffer et al.,2015). The first phase consisted of focus groups to identify barriers such as trust in quitlines, knowledge of quitlines and lack of telephone access. The second phase of the project was a community-based approach to quantify the findings from phase one through surveys (Sheffer et al., 2015). The survey was administered to the same two counties used in phase one, Lee (population 11,545) and Cross (population 19,237). The sample size of this exploratory, descriptive inquiry was 799

participants (Sheffer et al., 2015). The authors prepared a 27-item survey that addressed trust in tobacco cessation programs, telephone counseling concerns and availability of telephone use (Sheffer et al., 2015). The survey also included type of tobacco used, seven demographic items, current beliefs and spirituality, and questions about current knowledge of tobacco and quitlines (Sheffer et al., 2015). The survey results concluded that 34.9% of participants did not have access to a private phone, 6.68% believed that prayer and trust in God is the best way to quit, 6.62% believed that God will give them power to quit, 6.10% expressed importance of quitting, and 6.01% had confidence in permanently quitting (Sheffer et al., 2015). The survey results suggested that higher income participants had the most knowledge about quitting, but the least about quitlines (Sheffer et al., 2015). The lowest income group were most concerned about getting sick or developing cancer if they quit and expressed a greater amount of reasons to not quit tobacco (Sheffer et al., 2015). Furthermore, the lowest income group expressed the lowest knowledge in response to the importance of quitting (Sheffer et al., 2015). These findings suggest that quitlines are not feasible among some low socioeconomic populations due to lack of telephone access, lack of desire to quit, and knowledge of tobacco and cessation programs. A study strength was that the survey had a large sample size. This is significant to healthcare because this study showed the barriers to tobacco cessation in rural areas. The two significant barriers included desire to quit, telephone access and knowledge of tobacco/quitlines.

Researchers, Mussulman et al. (2014) conducted an RCT to determine the effectiveness and cost-effectiveness of integrated telemedicine counseling (ITM) in a physician office and telephone quitline counseling from home. The ITM was delivered in the physician's office through a two-way web-camera mounted on a physician computer to provide the patient with tobacco cessation education. This RCT targeted rural patients in Kansas. There was a total of 566

participants that were randomly divided into two groups ITM and phone (traditional telephone counseling from home) (Mussulman et al, 2014). The ITM group consisted of 280 participants and the phone group had 286 participants (Mussulman et al., 2014). The study used 20 primary care physician (PCP) offices with 68 physicians in rural Kansas (Mussulman et al., 2014). The researchers recruited participants from the PCP offices and safety net clinics via letters and phone calls. The phone group received four sessions of in-home telephone counseling. The ITM group received 4 sessions of telemedicine counseling in the patient's PCP office. The ITM group was part of the Connect2Quit (C2Q) program which optimized counseling and pharmacotherapy (Mussulman et al., 2014). The ITM group was integrated in the physician office and C2Q counselors delivered all the ITM sessions, scheduled the appointments with the receptionists, and worked with the physicians to update them on the patient progress (Mussulman et al., 2014). Both groups received the same content and pharmacological assistance. The study used a combination of motivational interviewing and cognitive behavior therapy in the four sessions. The primary study outcome measure was 7-day point prevalence smoking abstinence at 12 months following the sessions (no tobacco in the last 7 days) (The participants verified 12-month abstinence with mailed salivary cotinine analysis (15 ng/mL cut off point for study) (Mussulman et al., 2014). The participants were assessed at 3, 6, 12 months following the sessions for secondary outcomes of self-reported point prevalence abstinence, quit attempts, and average number of cigarettes smoked a day (Mussulman et al., 2014). The primary outcome goal of the study was to reach an 8% abstinence rate in the phone group and 16% abstinence rate in the ITM group (Mussulman et al., 2014). The study concluded that the ITM sessions were good for participants who lacked computers at home or computer knowledge since all trouble-shooting was done in the office. They found that between the two groups, 69.9% of participants had

computer access, 67.1% had internet access, and 40% of participants were not comfortable using computers (Mussulman *et al.*, 2014). The ITM session provided a way to monitor all other comorbidities along with tobacco cessation. Of all the participants 43.5% had hypertension, 39.7% had high cholesterol, 34% had chronic lung disease, and 18% had diabetes (Mussulman et al., 2014). The study did meet the goal of the 8% and 16% abstinence rate in the two groups but offered information on how the programs were delivered and the potential effectiveness. Some barriers to the program include; reliance on patient to stay in the treatments, insurance coverage and access to telephone and transportation. This study was representative of rural smokers with comorbidities who tend to lack health insurance. The C2Q program offers patients with integrated treatment plans and tobacco cessation education. If this program yields promising results, it could revolutionize for tobacco cessation education in rural towns. Providers could refer patients to the C2Q webcams and or offer at home webcam assistance. If insurances started to cover the program fees, the C2Q program could play a huge role in reducing tobacco use.

Researchers, Dotson, Nelson, Young, Buchwald & Roll (2017) produced a qualitative study to assess computer and cell phone access to American Indian college students in rural Montana for tobacco cessation. This study used convenience sampling to recruit 153 participants from two tribal colleges in Montana, Fort Peck Community College and Little Big Horn College. A 22-question survey was administered to the participants via pencil and paper. The survey consisted of yes/no and rate from 0-5 questions. The survey covered questions regarding cell phone type and ownership, access to service, use of cell phone and internet for health information, tobacco habits, tobacco cessation desire and demographics (Dotson et al., 2017). The researchers found that 131 respondents had cell phones, 98 had monthly plan, 33 had prepaid plans and 104 had internet access (Dotson et al., 2017). In addition, 40% of participants

smoked cigarettes and the mean age of starting cigarettes was 16 years old (Dotson et al., 2017). There was a difference between cell phone ownership and internet accessibility between the two college sites but the more rural areas had less access (Dotson et al., 2017). A weakness to this study was the small sample size. This study showed that rural college students have less internet and cell phone access compared to the nation's average college student. Tobacco cessation programs targeted towards rural areas need to be culturally appropriate and need to account for the lack of advanced technology.

Schoenberg et al. (2014) evaluated the effectiveness of faith-placed smoking cessation programs in the Appalachian Mountains through an RCT. The Appalachian Mountain region has some of the greatest poverty rates, and 90% of Appalachian residents claim to have some sort of religious affiliation (Schoenberg, 2014). This trial recruited 26 Appalachian churches with 590 participants (Schoenberg et al., 2014). The churches were randomized to early or delayed interventions. Early intervention occurred promptly and delayed occurred after one-month post-intervention (Schoenberg et al., 2014). Each congregation set its own terms for religious terms. Outcomes were measured baseline, one-month post intervention and six months post interventions. During the first three weeks the participants kept a record of cigarette smoking, free nicotine patches, and fellowship (Schoenberg et al., 2014). Following the interventions, 22 in person interviews with church leaders, participants and intervention leaders to evaluate the success of the program (Schoenberg et al., 2014). The results of the interviews were as follows; the church leaders liked that the programming brought people to the church and served as an outreach program (Schoenberg et al., 2014). The participants and intervention leaders felt that the church setting was comfortable and increased feelings of accountability. They felt like there were not stigmas from church members and the participants liked the program's convenience,

reduced costs, no wait list compared to state programs, spiritual assistance and fellowships (Schoenberg et al., 2014). Although church leaders tried to eliminate any stigmas against smokers some smokers perceived the stigmas as a barrier (Schoenberg et al., 2014). The successful cessation elements included informal word of mouth, cost effectiveness, location in a comfortable area, and social support (Schoenberg et al., 2014). A barrier to this program were the stigmas and spirituality. This program would be desirable for a spiritual community. This study is significant to healthcare because it helps eliminate barriers to tobacco cessation in rural areas. The results showed that this program reduces cessation costs, transportation and telephone barriers by having a faith placed program.

Walker et al. (2017) identified the relationship between pharmacotherapy and smoking cessation success rates and other covariates such as setting in this qualitative study. This study compared the effectiveness of varenicline and nicotine replacement. The researchers used observational data from 22,472 treatment episodes between 2013-2016 in England. They assessed the differences between varenicline and NRT by focusing on social deprivation, age, gender, ethnic group, treatment setting, nicotine dependence and treatment content (Walker et al., 2017). From the 22,372 treatment episodes, 15, 640 episodes were analyzed in relation to a 4-week quit group and 14,273 episodes were analyzed in relation to 12- week quit group (Walker et al., 2017). The primary outcome was the 4-week carbon monoxide-validated measure and the secondary outcome was 12-week self-reported quit success. The results showed that at both follow up points, varenicline yielded higher success rates compared to nicotine replacement therapy (Walker et al., 2017). The 12 week follow up point was most influenced by setting advice such as at a pharmacy or general practice office compared to the community setting

(Walker et al., 2017). This study is significant to healthcare because it showed the effectiveness of two common pharmacological agents in tobacco cessation and how setting plays a role.

Researchers Stead et al. (2013), reviewed the effectiveness of physician advice to promote tobacco cessation through a meta-analysis of 42 trials that ranged from the years of 1971- 2012 with 31,000 patients. Stead et al. (2013) used several databases to complete this research including the Cochrane Tobacco Addiction Group Trials registered in January 2013. Most of the physician interventions were delivered in the primary care clinics. Although the researchers noted that the primary care clinics had the heathier patients compared to the hospital setting patients, who were typically acutely ill (Stead et al., 2013). The inclusion criteria included advice given by medical doctor and abstinence assessed at least 6 months following initial advice. The researchers concluded that 17 trials showed that brief advice versus no advice increased rate of quitting in tobacco users, and 11 trials judged that intensive interventions were more effective (Stead et al., 2013). In addition, the researchers concluded that a brief intervention can increase quitting by 1 to 3% and follow ups also may increase quit rates slightly (Stead et al., 2013). Physicians can make an impact in tobacco quit rates in rural communities by initiating tobacco cessation interventions.

Conclusion

The articles reviewed in this chapter addressed the lack of nursing education, current nurse led intervention practices, barriers to rural communities and effective tobacco cessation interventions. The 17 articles reviewed included qualitative, randomized qualitative, descriptive, randomized control trials and meta-analysis studies. The literature revealed a gap in nursing education on tobacco cessation and lack of nursing confidence. Furthermore, there are several barriers to rural communities receiving effective tobacco cessation interventions such as

access to internet, cellphones and healthcare. Further research is required to study the effects of nurse led interventions in a rural setting. Additionally, tobacco cessation interventions that work in urban settings need to be re-evaluated for their effect in rural communities as access to amenities and healthcare are common barriers. Based on the results of the literature review, best practices guidelines for tobacco cessation education in nursing education and rural communities needs to be updated.

CHAPTER THREE

Best Practice Recommendations: Nursing Education and Tobacco Cessation Interventions

The purpose of this thesis was to create best practice recommendations to improve tobacco cessation education amongst nurses and tobacco cessation interventions in rural communities. This chapter will highlight the best practice recommendations gathered from the literature search.

The literature review in Chapter 2 provided the framework for Chapter 3. The literature has shown five areas of interest: Nursing education, Current Nurse Tobacco Cessation Knowledge in the Clinical Setting, Effectiveness of Nursing Smoking Cessation Counseling, Tobacco Cessation Programs in Low Socioeconomic Populations and Rural Areas, and Tobacco Cessation Interventions. This chapter will address how nursing education can impact cessation quit rates, what is the current nurse practice in the field, effectiveness of nurse led tobacco cessation interventions, barriers to rural communities, and effective tobacco cessation interventions for rural communities. Currently there are gaps in tobacco cessation curriculum for nurses which is impacting nurse led tobacco cessation interventions with patients. Nurses have the potential to make a difference, especially in rural communities where access to healthcare is limited. The following tables highlight the recommendations and rationales of the 17 articles reviewed.

Table 1: *Nursing Education*

Recommendation	Rational	References	Level of Evidence
Increase time spent on tobacco cessation curriculum in nursing education.	Reinforcing tobacco cessation curriculum increases tobacco cessation nursing interventions in the clinical setting by	Petersen et al., 2017	Level VI: qualitative study (Melnyk & Fineout-Overholt, 2011)

	increasing knowledge, skills, attitudes and confidence required to implement interventions.		
	Increasing time spent on tobacco curriculum will increase perceived knowledge and confidence in implementing cessation information with nurse practitioners.	Whitehead et al., 2014	Level VI: qualitative study (Melnyk & Fineout-Overholt, 2011)
	Continuing education in nurse led brief tobacco cessation intervention skills increases rates of nurses asking patients about tobacco use, willingness to quit and recommendation counseling.	Kralikova et al., 2016	Level VI: single-group qualitative (Melnyk & Fineout-Overholt, 2011)

As seen in Table 1, the literature states nurses are obligated to initiate tobacco cessation interventions by the ANA standards (Rice et al., 2017). In order to properly lead these interventions, nurses need to be properly trained. Increased time spent on tobacco cessation curriculum in nursing education will increase knowledge, skills, attitudes and confidence required to implement interventions (Petersen et al., 2017). Furthermore, confidence is a huge factor in nurse motivation to lead nurse tobacco cessation interventions (Whitehead et al., 2014). In addition, nurses taught how to lead nurse led tobacco cessation interventions will increase quit rates in patients. Kralikova et al. (2016) found that nurses taught in an online class on tobacco cessation education increased their rate of asking patients about tobacco habits from 56% (pre-

class) to 66% (post- class) and recommending stopping tobacco use from 21% (pre-class) to 33% (post-class).

Table 2: *Current Nurse Tobacco Cessation Knowledge in the Clinical Setting*

Recommendation	Rational	References	Level of Evidence
Provide practicing nurses with standing orders to complete tobacco cessation counseling with patients and provide an environment that encourages nurses to provide tobacco cessation interventions.	Nurses with standing orders are five times more likely to have the confidence to deliver the 5 A's to patients. Confidence is a big contributor to a nurse's willingness to provide tobacco cessation interventions.	Health et al., 2017	Level VI: Descriptive Correlational (Melnyk & Fineout-Overholt, 2011)

Nurses need to be in an environment that enables nurse led tobacco cessation interventions. As shown in Table 2, standing orders help remind nurses to start the conversation with patients about tobacco use and implement the 5 R's and 5 A's (Heath et al, 2017). If the nurses' employer supports and encourages tobacco cessation education, the nurses are more likely to be willing and confident in executing tobacco cessation education in smoking patients.

Table 3*: Effectiveness of Nursing Smoking Cessation Counseling*

Recommendation	Rational	References	Levels of Evidence
Nurses have the potential to increase quit rates in smokers through nurse led interventions.	Practiced nurses and general practitioners are equally effective in tobacco cessation education to smoking patients.	Rossem et al., 2017	Level II: Randomized pragmatic two group-controlled trial (Melnyk & Fineout-Overholt, 2011)
	Nurses are effective in nurse initiated and delivered tobacco cessations	Rice et al., 2017	Level I: Meta-analysis

	interventions in adults. They have the potential to increase quit rates in the hospital and community settings.		(Melnyk & Fineout-Overholt, 2011)

As shown in Table 3, nurses are just as effective as physicians in tobacco cessation interventions (Rossem et al., 2017). Nurses and physicians should work together improve the quit rates, especially in rural communities where healthcare personnel and access are lacking. Nurses should be encouraged to initiate nurse led tobacco cessation interventions because Rice et al. (2017) found that a brief led intervention compared to no intervention increased quit rates. Furthermore, patient setting does not influence the effectiveness of a nurse a led intervention (Rice et al., 2017). Nurses can implement tobacco cessation education and interventions in patient and community settings.

Table 4: *Tobacco Cessation Programs in Low Socioeconomic Populations and Rural Areas*

Recommendation	Rational	References	Levels of Evidence
Improve access to tobacco cessation health care in rural communities and appoint tobacco education dedicated staff to collaborate with the community and staff.	Barriers to tobacco cessation healthcare in rural communities includes normalization of tobacco use, mental illness, access to facilities, and limited collaboration within the community and facilities.	Tall et al., 2015	Level VI: Qualitative (Melnyk & Fineout-Overholt, 2011)

There are several barriers to effective tobacco cessation interventions in rural communities and the biggest contributor is socioeconomic factors. As seen in Table 4, barriers to tobacco cessation healthcare in rural communities includes normalization of tobacco use, mental

illness, access to facilities, and limited collaboration within the community and facilities. These barriers need to be addressed and assessed in order to implement effective tobacco cessation programs. Tall et al. (2015) explained that having an appointed tobacco cessation specialist that collaborates with the community and within the facility to facilitate tobacco cessation education can be beneficial to communities with limited healthcare resources.

Table 5: *Tobacco Cessation Interventions*

Recommendation	Rational	References	Levels of Evidence
Provide tailored tobacco cessation education to low socioeconomic smokers.	Evidenced based tailored tobacco cessation programs can improve short term goals and reduce relapse rates of tobacco use.	Sheffer et al., 2017	Level II: RCT (Melnyk & Fineout-Overholt, 2011)
	Tailored tobacco cessation programs have higher satisfaction rates compared to state quit line use. Individual tailored programs are ideal but not feasible to everyone. State quitlines are able to reach a wider audience at a reduced rate but do not address individual comorbidities.	Vander Weg et al., 2016	Level II: RCT (Melnyk & Fineout-Overholt, 2011)
Quitlines are successful in providing tobacco cessation when accessible and should be assessed when working with patients.	Quitlines are not feasible amongst low socioeconomic populations due to lack of telephone access, lack of desire to quit, and knowledge of tobacco	Sheffer et al., 2015	Level VI: qualitative study- exploratory, descriptive inquiry (Melnyk & Fineout-Overholt, 2011)

	and cessation programs.		
Integrated telemedicine counseling combined with motivational interviewing and cognitive behavior therapy can provide effective tobacco cessation education and reach a wider rural health population.	If health insurance starts to cover C2Q program fees and patients have access to primary care offices with webcams, more rural health patients could be referred to trained tobacco cessation personnel to increase quit rates.	Mussulman et al., 2014	Level II: RCT (Melnyk & Fineout-Overholt, 2011)
Tobacco cessation programs targeted towards rural areas need to be culturally appropriate and need to account for lack of advanced technology.	Between two college campuses in Montana, the rural college campus had significantly less access to internet and telephone use for tobacco cessation interventions.	Dotson et al., 2017	Level VI: Qualitative (Melnyk & Fineout-Overholt, 2011)
Tobacco cessation interventions should involve the community.	Tobacco cessation programs that take place in community church settings are cost effective and decrease barriers to transportation and telephone use but are ideal for spiritual or religious smokers.	Shoenberg et al., 2014	Level II: RCT (Melnyk & Fineout-Overholt, 2011)
When medically appropriate and if desired by the patient, varenicline should be prescribed to patients.	When compared to nicotine replacement therapy, varenicline yields the highest rate of smoking cessation.	Walker et al., 2017	Level V: Qualitative (Melnyk & Fineout-Overholt, 2011)
Providers should continuously assess patients for tobacco use and willingness to quit.	When compared to no intervention, physician-initiated conversations and recommendations to quit tobacco use	Stead et al., 2013	Level I: Meta-analysis (Melnyk & Fineout-Overholt, 2011)

	increases tobacco quit rates.		

Tobacco cessation interventions need to address the socioeconomic status of the population. As mentioned earlier in Table 5, rural communities have barriers to affordable and effective healthcare programs. Sheffer et al. (2017) found that tailored tobacco cessation programs can improve short term goals and reduce relapse rates of tobacco use. Furthermore, Vander Weg et al. (2016), found that tobacco cessation programs have higher satisfaction rates compared to state quit line use. Except, tailored programs are not always feasible and accessible in rural communities. Transportation and health insurance costs are barriers to tailored programs. Table 5 shows quitlines are an alternative to tailored programs and are successful in providing tobacco cessation when but are not always accessible (Sheffer et al., 2015). In addition, Quitlines require populations to have telephone access, a desire to quit, and knowledge of tobacco and cessation programs (Sheffer et al., 2015). As seen in Table 5, integrated telemedicine counseling such as C2Q in primary care offices combined with motivational interviewing and cognitive behavior therapy can provide effective tobacco cessation education and reach a wider rural health population (Mussulman et al., 2014). The barriers to integrated telemedicine include transportation to a primary care office, access to an internet and a webcam, and health insurance cost. If health insurance starts to cover C2Q program fees and patients have access to primary care offices with webcams, more rural health patients could be referred to trained tobacco cessation personnel to increase quit rates (Mussulman et al., 2014). In addition, tobacco cessation programs need to be to be culturally appropriate and need to account for lack of advanced technology in rural areas. Dotson et al., (2017) found that between two college campuses in Montana, the rural college campus had significantly less access to internet and telephone use for tobacco cessation interventions. Rural communities struggle with the

accessibility to telephone use. Rural communities also need involve the community. Faith based programs in the community offer support with transportation and costs but require participants to be open to the idea of religious affiliations (Shoenberg et al., 2014). Finally, Table 5, explains physicians should continuously assess patients for tobacco use and willingness to quit. When compared to no intervention, physician-initiated conversations and recommendations to quit tobacco use increases tobacco quit rates (Stead et al., 2013). Physician intervention can include prescriptions to varenicline. Walker et al., 2017 found that when compared to nicotine replacement therapy, varenicline yields the highest rate of smoking cessation (Walker et al., 2017). Barriers to physician interventions include health insurance costs and transportation in rural communities.

Conclusion

The literature shows there are gaps in the nursing curriculum and nurses are just as effective as physicians in providing tobacco cessation interventions with patients. This chapter discussed the various barriers to rural communities receiving tobacco cessation and ways to overcome these barriers. The following chapter will discuss a proposed implementation plan of the best practice recommendations.

CHAPTER 4

Implementation of Best Practices in Tobacco Cessation

Based off the best practice recommendations, chapter 4 will be centered around implementing a virtual tobacco cessation curriculum in the Bachelor of Nursing Science Program at the University of Arizona. The proposed implementation will include an online course and pre- post surveys. The best practice recommendations acknowledge there is a gap in nursing curriculum that needs to be addressed to help reduce tobacco use especially in rural communities. The proposed curriculum will target nursing students and emphasize motivational interviewing, tobacco cessation education, and building the skills needed to provide counseling to patients. In addition, the proposed curriculum will address barriers to rural communities such as lack of health insurance, transportation and telephone access. The implementation of this curriculum will follow the Plan-Do-Study-Act-Model (PDSA). The PDSA tool is a tool used in health care facilities to effectively implement and evaluate a study (Institute for Healthcare Improvement, 2017). The implantation aspects of this tool include the “plan” and “do” and the evaluation aspects include the “study” and “act”. The PICOT question that will guide this implementation will be as follows: the proposed population of student nurses, the intervention will be nursing education and nurse led interventions in the clinical setting, compared to no education or intervention, with an outcome to increase nurse confidence, attitudes and skills over a 6 month time frame in health clinics in rural communities. The final portion of this chapter will discuss the strengths and limitations of this thesis.

Plan

The plan portion of PDSA cycle includes generating the plan and specific actions implement the plan (Institute for Healthcare Improvement, 2017). The proposed implementation will be conducted at the University of Arizona in the Bachelor of Nursing Science Program. The University of Arizona College of Nursing was selected because of the author's familiarity with the program and its ability to reach rural communities, specifically rural areas of Pima County. The author will work with faculty to implement the virtual curriculum into the course, ideally during a community health or psychiatric rotation where students are exposed to rural communities. The curriculum will begin at the beginning of the semester, so the students have time to implement their skills into the clinical setting. The author will work with College of Nursing Technology Resources to design an interactive website that will allow students to test their knowledge and build motivational interviewing skills.

Do

The "do" portion of the PDSA cycle includes implementing the proposed project (Institute for Healthcare Improvement, 2017). The website will be designed using a Backward Design Framework. The Backward Design has developers consider the learning goals of the course first and how to assess these overarching goals prior to the development of how to teach the content (Bowen, 2017). The three overarching goals for the curriculum will be for students to be knowledge in tobacco education, have the skills to intervene and understand barriers to rural communities, and the confidence to implement the nurse led interventions. The curriculum will be divided into three sections: tobacco education, nurse led interventions, and barriers to rural communities. The tobacco education will highlight important statistics about tobacco use in America and in rural communities. In addition, it will discuss the nations' Healthy People 2020 goals on tobacco use. The tobacco education section will also discuss the impact negative

tobacco has on the body and the benefits to quitting. This section will be brief compared to the nurse led interventions. The nurse led interventions will teach the students about the 5 R's and the 5 A's and how to properly have these discussions with patients. There will be several virtual scenarios for the students to practice and solidify their interviewing skills. In addition, students will have a brief review of health literacy and how make sure pamphlets are appropriate for a desired audience. The final component of the curriculum will discuss the barriers to rural communities and what resources are available for Pima County rural residents. The website design will be accessible for students who follow under the Americans with Disabilities Act (ADA). The author will utilize Al Text and Color Contrast Checker to ensure the website design is appropriate for ADA students. There are two possible website generators that author could use-Articulate Storyline or Articulate Rise. The author will use Articulate Storyline for the curriculum because its ability to customize visuals and interactions and be made highly accessible to assistive technologies such as screen readers for ADA students. Although this website design is very intensive to develop, it allows the author to develop the interactive motivational interviewing scenarios for the students. Articulate Storyline can include assessment questions such as true/false, multiple choice, multiple response, fill in the blank, matching, sequencing, drag and drop, and image selection. The other website design, Articulate Rise has limited accessibility capabilities and is less customizable but is quick to develop. This would be ideal for a population where an interactive motivational interview is not required. The curriculum will not be grade but it will be up to the faculty's digression on how they would like provide credit to the students for the curriculum.

Study

The "study" portion of the PDSA cycle includes analyzing the data collected from the "do" portion (Institute for Healthcare Improvement, 2017). The students will receive a pre-survey and two post-surveys. The surveys will be a 6-question tool that will identify the students' knowledge, beliefs and skills of tobacco cessation. There will be 2 questions on each section. The survey will be delivered via Qualtrics, a survey tool the University of Arizona owns, and students can access after they graduate. The survey will be administered prior to the online class and immediately after, then 6 months following the class. The survey statistics will allow the author to determine if the PICOT question was addressed appropriately and how to improve the curriculum for future cohorts.

Act

The "act" portion of the PDSA cycle includes evaluating and analyzing where changes can be made for future projects (Institute for Healthcare Improvement, 2017). The pilot cohort will help develop a standardized plan for future cohorts and will identify areas that can be strengthened. Ideally this curriculum will expand to all providers at the University of Arizona including the College of Medicine and College of Pharmacy. The more providers that are educated, there is an increased ability to reach a wider audience to end the tobacco epidemic in rural communities.

Strengths and Weaknesses of the Honors Thesis

The strengths of this thesis include the extensive literature review, a comprehensive analysis of each article, and all articles are published within 10 years. The extensive literature review includes a variety of articles including meta-analysis and randomized control trials. In addition, each article is thoroughly analyzed and evaluated in chapter 2. The weaknesses of this

thesis include not focusing on one specific rural population and generalized recommendations. Each rural community has unique barriers to its community. This thesis focused rural communities as a whole and not a specific community. The proposed implementation will focus on a specific rural community- rural communities of Pima County. Furthermore, the recommendations are generalized and not as specific because they were intended to reach a wider audience.

Summary

The purpose of this thesis was to develop best practice recommendations for tobacco cessation in rural communities. An extensive literature review was completed in chapter 2 and chapter 3 focused on developing best practice recommendations for the proposed implementation. Tobacco use is still a problem in rural communities and nurses have the potential to decrease the tobacco use rate in these areas where barriers to healthcare exist. The proposed implementation will teach nursing students at the University of Arizona on tobacco education and how to effectively intervene in rural communities. Further research can be done to expand this literature to include E-Cigarette use and the impact of vaping. In addition, the proposed implementation could be carried out to clinics in rural communities and provide the virtual education as continuing education units to nurse. This thesis has set the foundation to provide future education to nursing students, providers, and healthcare workers in rural communities.

References

Bowen, R. (2017). Understanding by design. Vanderbilt University Center for Teaching. Retrieved from https://cft.vanderbilt.edu/guides-sub-pages/understanding-by-design/#benefits

Brenan, M. (2018). Nurses again outpace other professions for honesty, ethics. Retrieved from www.new.gallup.com.

Centers for Disease Control and Prevention. 2018. Extinguishing the tobacco epidemic in Arizona. Retrieved from www.cdc.gov/tobacco

Dotson, J., Nelson, L., Young, S., Buchwald, D & Roll, J. (2017). Use of cell phones and computers for health promotion and tobacco cessation by American Indian college students in Montana. *Rural and Remote Health 17:*4014. Retrieved from http://www.rrh.org.au.

U.S. Department of Health and Human Services [USDHHS], Office of Disease Prevention and Health Promotion, Healthy People 2020. (2018). Tobacco Use. Retrieved from healthypeople.gov/2020goals

Heath, J., Butler, K., Anderson, J., Craig, S., Barone, C. & Andrews, J. (2017). Tobacco-Cessation interventions and attributes of individual and organizational excellence in acute care. *AJCC American Journal of Critical Care, 26* (1), 53-61. doi: 10.4037/ajcc2019373

Kralikova, E., Felfrova, V., Kulovana, S., Mala, K., Nohavova, I., Roubickova, E., & Sarna, L. (2016). Nurses' attitudes toward intervening with smokers: Their knowledge, opinion and e-learning impact. *Central European Journal of Public Health*, *24* (4), 272-275. doi: 10.21101/cejph.a4652

Melnyk, B.M. & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing and healthcare*, 2nd Edition. Philadelphia: Lippincott Williams and Wilkins

Mussulman, L., Ellerbeck, E., Cupertino,P., Preacher, K, Spaulding, R., Catley, D., Cox, L., Lambart, L., Hunt, J., Nazir, N., Shireman, T., & Richter, K. (2014). Design and participant characteristics of a randomized controlled trial of telemedicine for smoking cessation among rural smokers. *Contemporary Clinical Trials 38*(2):173-181. doi:10.1016/j.cct. 201404.008

Petersen, A.,Meyer, B., Sachs, B., Bialous,S. & Cataldo, J. (2017). Preparing nurses to intervene in the tobacco epidemic: Develop model for faculty development and curriculum redesign. *Nurse Education in Practice*, *25*, 29-35. DOI: 10.1016/j.nepr.2017.04.005

Rice, V., Heath, L., Livingstone-Banks, J., & Hartmann-Boyce, J. (2017). Nursing interventions for smoking cessation (Review). *Cochrane Database of Systematic Reviews.* doi: 10.1002/14651858.CD001188.pub5.

Rossem, C., Spigt,M., Viechtbauer, W., Lucas, A., Van Schayck, O., & Kotz, D. (2017). Effectiveness of intensive practice nurse counselling versus brief practitioner advice, both combined with varenicline, for smoking cessation: a randomized pragmatic trial in primary care. *Society for the Study of Addiction*, *112*, 2237-2247. doi: 10.1111/add.13927

Schoenberg, N., Bundy,H., Baeker, J., Studts,C., Shelton, B, & Fields, N. (2015) A rural Appalachian faith-placed smoking cessation intervention. *Journal of Religion Health* 25:598-611. doi: 10.1007/s10943-014-9858-7

Sheffer,C., Brackman, S., Lercara,C. Cottoms, N., Olson, M., Panissidi, L., Pittman, J., & Stayna, H. (2015). When free is not for me: Confronting the barriers to use of free

quitline telephone counseling for tobacco dependence. *International Journal of Environment Research and Public Health* 13,15 doi:10.3390/ijerph13010015

Sheffer, C., Bickel, W., Franck, C., Panissidi, L., Pittman, J., Stayna, H., & Evans, S. (2017). Improving tobacco dependence treatment outcomes for smokers of lower socioecomic status: A randomized clinical trial. *Drug and Alcohol Dependence 181*, 177-185. doi: 10.1016/j.druglcdep.2017.09.015

Stead, L., Buitrago,D., Preciado,N., Sanchez, G., Hartmann-Boyce,L., & Lancaster,T. (2013). Physician advice for smoking cessation (Review). *Cochrane Database of Systematic Reviews.* doi: 10.1002/14651858.CD000165.pub4

Tall, J., Brew, B., Saurman, E., & Jones, T. (2015). Implementing an anti-smoking program in rural remote communities: challenges and strategies. *Rural and Remote Health 15*:3516. Retrieved from http://www.rrh.org.au

Vander Weg, M., Cozad, A., Howren, B., Cretzmeyer, M., Scherubel, M., Turvey, C., Grant, K., Abrams, T., & Katz, D. (2016). An individually tailored smoking cessation intervention for rural veterans: a pilot randomized trial. *BMC Public Health 16*:811. doi:10.1186/s12889=016-3493-z

Walker, N., Gainforth, H., Kiparoglou,V., Robinson, H., Van Woerden, H., & West, R. (2017). Factors moderating the relative effectiveness of varenicline and nicotine replacement therapy in clients using smoking cessation services. *Society of the Study of Addiction 113*,313-324. doi:10.1111/add.13004

Whitehead, D., Zucker, S., Stone, J. (2014). Tobacco cessation education for advanced practice nurses. *Nurse Educator*, *39*(5), 252-255. doi: 10.1097/NNE.0000000000000056

Appendix 1

Table of Findings: Best Practices in Tobacco Prevention Date: April 2019

Nursing Education:

Author (s) and date	Questions, variables, objectives, hypotheses	Design, samples, settings	Findings	Notes
Petersen et al., 2017	-Purpose: Assess knowledge of smoking cessation interventions in nurses -Practicing nurses and nursing students exhibit limited knowledge, skills and confidence required to reduce tobacco -Minimal inclusion of tobacco cessation interventions taught in nursing programs -Limited knowledge of tobacco and tobacco cessation interventions by nursing faculty	-Qualitative study -Loma Linda University -42 faculty (77% undergraduate and 23% graduate) members -Survey administered to faculty for baseline knowledge assessment -Survey findings used to implement tobacco cessation workshops and curricula redesign -Educational goals at year one and curriculum review at year two	-Baseline survey- 41.5% reported no previous knowledge in tobacco dependence treatment and 48.8% in tobacco dependence -Increased awareness of tobacco curriculum being taught (53.7%-81%), student interventions used (17.1%- 42.5%) and co-faculty members with previous tobacco cessation experience (36.6%-71.4%) -No significant changes in mean confidence in regard to tobacco related skills, but changes in attitudes towards patients with tobacco addictions	-Survey administered through Survey Monkey and analyzed through SPSS Version 19 -Groups compared used *t*-tests, Chi-Square, Fisher's Exact Tests -Nurse Practitioner program increased clinical training skills the most (0-6 hours). -Barriers include lack of time, large nursing curriculum, lack of clinical sites where tobacco cessation is provided by nurses -Faculty attitudes towards tobacco control has the greatest influence on teaching the content

				-IRB approved
Whitehead et al., 2014	-Purpose: To increase knowledge on tobacco cessation in Nurse Practitioner Programs and increase perceived confidence in implementing smoking cessation information -Will the education program based on Rx for Change Theory increase APRN student's knowledge, skills, and confidence in tobacco cessation interventions?	-Qualitative study -Pretest-posttest design -Online education program on tobacco cessation, interview and pre/post survey -20 question survey with a t Cronbach's alpha of .81 -Sample size 36 students out of a 40-student class -Convenience sample for APRN students enrolled in MSN Family Nurse Practitioner Program in south Florida in 2013	-Mean knowledge on pre-survey was 9.77 and post-survey was 17.47 -Mean confidence on pre-survey was 16.41 and post-survey was 39.36 -Statistically significant increase in participant's perceived knowledge and confidence	-Small group study -Paired *t*-tests were used to analyze pre and post surveys -The Rx for Change is a standardized curriculum based on the Clinical Practice Guideline for treating Tobacco -Restraints include lack of time, lack of resources, lack of faculty, and lack of institutional support -IRB approved
Kralikova et al.,, 2016	-Purpose: To increase the knowledge of tobacco cessation and confidence of Czech Republic nurses through an e-learning program	-Single-group design -279 nurses in the Czech Republic in 2014 Advertised on nursing websites and seminars -Pre/post survey -E-learning program included the role of nursing in tobacco cessation and smoking cessation within oncology settings	-Asking patients about tobacco habits 56-66% -Recommendations to cease smoking 21% to 33% -Recommending smoke-free home 36-58% -Overall nurse confidence with tobacco cessation did not significantly increase	-Data was analyzed using SAS 9.4 to describe demographics -Intervention changes were analyzed by Generalized Linear Mixed Model -Bias responses -Only 5 men out of the 279 nurses -IRB approved

Current Nurse Tobacco Cessation Knowledge in the Clinical Setting:

Author (s) and date	Questions, variables, objectives, hypotheses	Design, samples, settings	Findings	Notes
Heath et al., 2017	-Purpose: Identify relationships between the 5 A's (ask, advise, assess, assist and arrange) framework -Individual and organizational characteristics of excellence -Intentions to implement tobacco cessation interventions as daily care	-Descriptive, correlational qualitative study -Recruited participants from the National Teaching Institute in Boston, Orlando and Chicago -American Association of Critical-Care Nurses (AACN) -Used a 21-item survey instrument based off of the Theory of Reasoned Action with a Croncbach alpha of .71 -1,773 surveys were assessed that met the inclusion criteria	-Nurses from organizations with standing orders for tobacco cessations were 5 times more likely to have high confidence in 5 A's Skills (odds ratio, 5.037; 95% CI, 3.429-7.400; P <.001) -Staff nurses had lower levels of confidence in implementing tobacco cessation compared to managers, educators, researchers, and advanced practice nurses (odds ration, 0.557; 95% CI, 0.310-0.0973; P= .04). -Nursed with high levels of confidence in 5 A's (specifically the assess part) were four times more likely to integrate tobacco cessation interventions (odds ratio, 4.280; 85% CI, 1.380-13.270; P=.01) -Organizational status of Magnet and/or Beacon did not yield statically	-The study did not control for nurses' responses from the same hospital or who had completed the survey in the past -Survey participants were put into a drawing for $100 gift card to the AACN bookstore. -91% of study participants were female -Data was examined using the SPSS version 22 for missing data and outliers

			significant results. Nurses were 1.5 times more confident in their ability to assist in tobacco cessation if in Beacon status environments is clinically significant	

Effectiveness of Nursing Smoking Cessation Counseling:

Author (s) and date	Questions, variables, objectives, hypotheses	Design, samples, settings	Findings	Notes
Rossem et al., 2017	-Purpose: Study effectiveness of counseling by a practiced nurse (PN)versus brief advice of a general practitioner (GP) both combined with pharmacotherapy and 6 months tobacco abstinence (primary outcome) -Patient 12-month abstinence, medication adherence, and incremental costs per life-year gained (secondary outcome) -Abstinence rates were expected to be 35% in PN versus 20% for GP	-Pragmatic, randomized, two-group controlled trial -Network of primary healthcare settings in the Netherlands -Multi-site (n=10) -Practice nurse (n=149), general practitioner (n=146), 295 randomized adult smoking patients -Power analysis showed 136 patients were required per group -Measured by abstinence of tobacco	-Abstinence rate of PN versus GP was 32.2% versus 39% from weeks 9-26, and 25.5% to 28.8% from weeks 9-52 -Values from Bayes factor indicate both are effective equally -Good dosing adherence lower for PN (45.5% compared to GP 62.0%)	-The 10 sites used covered over 65,000 patients -Randomly assigned 1:1 ratio using computer sequence -PN groups were offered several face to face or telephone meetings while GP was one visit -Statistical analysis SPSS and R was used to evaluate data with alpha of .05 (two sided) and 95% confidence interval -Did not discuss limitations

Rice et al., 2017	-Purpose: Study the effectiveness of nursing initiated and delivered tobacco cessations interventions in adults compared to no intervention -More effective if intervention is more intensive -Health state and setting of participants -More effective with follow ups -More effective if nurses demonstrate the pathophysiological effect of smoking	- Selection criteria: randomized trials of smoking cessation interventions given by nurses with follow ups at least 6 months -Review of clinical trials by two researchers independently which included 58 studies where nurses gave tobacco cessation interventions to smokers - >20,000 participants included in main analysis from general community to hospitalized hospitals - Most recent research occurred in January of 2017	-Advice and support from nurses has the potential to increasing quit rates in smokers in hospitals and community settings - 11 studies found that adding more components to nurse interventions did not change the impact - Quality of evidence is moderate due to unexplained statistical heterogeneity	-Nurses were with a specialist health promotion, in-conclusive if general nurses could do this -Need to study "brief advice by nursing" since this is more realistic

Tobacco Cessation Programs in Low Socioeconomic Populations and Rural Areas:

Author (s) and date	Questions, variables, objectives, hypotheses	Design, samples, settings	Findings	Notes
Tall et al., 2015	Purpose: Explore the experiences of PHC staff involved in implementing an anti-smoking campaign in rural Australia	-Observational study -Purposeful selection of participants -Location: Far-western NSW -6-member team led semi-	-Programs challenges included: -Limited collaboration between health services -Difficulty accessing staff training	-Phenomenological approach -Population of indigenous and no-indigenous residents

		structured interviews and focus groups -Interviews audio recorded and professionally transcribed -Interviewed service managers, case managers and general practitioners involved in starting the program between 2008-2010	-Mental illness -Normalization of smoking in the community Strategies to overcome challenges: -Appointed tobacco-dedicated staff -Improve health collaboration -Improve access to healthcare -Provide subsidized pharmacotherapy	

Tobacco Cessation Interventions:

Author (s) and date	Questions, variables, objectives, hypotheses	Design, samples, settings	Findings	Notes
Sheffer et al., 2017	-Purpose: To reduce the socioeconomic gradient in treatment for tobacco cessation of lower diverse socioeconomic smokers -Examine the effectiveness of adapted treatment to treat lower socioeconomic smokers -Hypothesized that the adapted treatment group would increase the latency to relapse and have greater initial, ST,	-Randomized control trial -227 participants >18 years old and ready to quit within 30 days -Sample size determined from the slope of the effects of SES on LT StdT abstinence rates in the community to allow between 220-253 participants -Two groups, adapted treatment or standard treatment -Recruited via mouth, fliers, and newspaper advertisement	-Systematic adaption of evidence-based treatment for tobacco cessation can improve short term treatment goals and reduce relapse rates -The AdT reduced the days to relapse for the two lowest SES groups -Interactions between socioeconomic status and conditions were	-IRB approved -Groups randomized by the study coordinator -Potential bias from blind treatment providers -EBT (Evidence based treatment) -LT (long term) abstinence, abstinence >6 months -ST (Shortterm) abstinence -SES index of social and economic position -AdT

	and LT abstinence rates among the lowest SES smokers		significant for initial abstinence and not for 6-month abstinence -No significant differences in long term abstinence	(adapted treatment) -StdT (standard treatment)
Vander Weg et al., 2016	-Purpose: Determine feasibility and efficacy of individually-tailored tobacco cessation interventions for rural veteran smokers -Addressed other comorbidities that could interfere with likelihood of quitting such as depressive symptoms, risky alcohol use and weight gain -Tailored vs. Quitline study groups -Outcome: 7 day self-reported absistence at 12 weeks and 6 months after participants target quit days	-Randomized Controlled Pilot Study -Convenience sampling -Individuals identified from the EMR (847) and were recruited via mailed letters (706) - Those who expressed interest received consent and baseline questionnaire via mail -Participants randomly assigned to Tailored group or Quitline group -Interventions included tailored tobacco management, mood management, alcohol risk reduction, weight management, and pharmacotherapy -Sample size: n=25, 50 participants needed total -63 veterans included in the study; Tailored= 31, Quitline Referral= 32	-12 week quit rates: Tailored= 39%; Quitline Referral= 25% -6 month quit rates: Tailored= 29%; Quitline Referral= 28% -Treatment satisfaction: "extremely useful" Tailored=74%; Quitline=46% -86% of individuals in Tailored group liked that the interventions addressed multiple issues -Odds ratio of quitting 90% higher in Tailored group at 12 weeks, no difference at 6 mo. Not statistically significant -Quitline just as effective as Tailored approach	-Participants had to have telephone access -Tobacco management was successful but participants with risky alcohol were reluctant to alcohol interventions -Weakness: reliance on self-report -State Quitline offered more pharmacological interventions than other states -IRB approved

Sheffer et al., 2015	Purpose: Assess barriers to Quitline cessation interventions in the Arkansas Mississippi delta region -Second phase of a project: used community-based participatory approach to the first phase -First phase: conducted qualitative examination of barriers to Quitlines	- Exploratory, descriptive inquiry -Qualitative -Survey administered to the same counties as the first phase: Cross=49.4%, Lee=39.2%, Arkansas counties=6% -27 item survey: demographic items, tobacco use, knowledge, attitudes and beliefs, one open ended question -Survey mailed -Data analyzed using SPSS version 20 -Sample size, n=799	-Survey results: 34.9% did not have access to a private phone; 6.68% believed that prayer and trust in God is the best way to quit, 6.62% believed that God will give them the power to quit, 6.10% expressed importance of quitting, 6.01% had confidence to quit for good -High income group had the most knowledge about quitting but the least about Quitlines -Lowest income group were most concern about getting sick or cancer if they quit, expressed greatest levels of reasons to not quit, and showed the least importance of quitting	-First phase results showed lack of knowledge and trust in Quitlines and limited availabilities to telephones -IRB approved<br->18 years old
Mussulman et al., 2014	Purpose: Determine the effectiveness and cost-effectiveness of ITM compared to Phone counseling for smoking cessation	-Randomized control trial - Sample size: 566 participants; n=283 per group for SEM analyses; ITM= 280, Phone=286 -20 PCP offices in rural	-69.9% of participants had a computer at home, 67.1% had internet access, 40% were not comfortable using computers	-Author manuscript -ITM= Integrated Telemedicine -Phone= Traditional Telephone Counseling

	-Two groups: Phone group vs ITM group -Content for each group remained consistent	Kansas with 68 physicians -Connect2Quit=ITM -Patients recruited from PCP offices and safety net clinics via letters and phone calls -Phone group received 4 sessions of in-home telephone counseling. ITM group received 4 sessions of telemedicine counseling in the patient's PCP office. Both groups received same content and pharmacological help -Assessed at 3,6, 12 months	-ITM good for participants who lack computers at home or computer knowledge -43.5% of participants had HTN, 39.7% had high cholesterol, 34% had chronic lung disease, and 18% had diabetes -ITM provides a way to monitor other comorbidities along with smoking cessation	-Distance based tobacco treatment vs. distance based integrated with PCP office - Monitored intervention procedures and verified smoking status with biochemical -PCP office needed to have high-speed internet, large patient volume, and exam room -PCP office reimbursed $1,000. Participants reimbursed $100 -IRB approved ->18 years old
Dotson et al., 2017	-Purpose: Assess computer and cell phone access to American Indian college students in Montana	-Qualitative study -Convenience and snow ball sampling -Sample size, n=153 participants -Participants recruited from two tribal colleges in Montana, Fort Peck Community College (45%) and Little Big Horn College (55%) -22 question survey administered to participants that included yes/no and rate from 0-5 questions	- 131 respondents had a cell phone; 98 had monthly plans, 33 had prepaid plans, 104 had internet access -40% of participants smoked -Mean age of smoking initiation was 16 years old -Different cell phone ownership and internet accessibility	-Small sample size and not indicative of all tribal areas -Smoking cessation programs need to be aware of cell phone and internet access -IRB approved ->18 years old

		-Survey paper and pencil and about 10 minutes to complete	between sites, more rural site less access -55% were female and 44% were male	
Schoenberg et al., 2014	-Purpose: Evaluate the effectiveness of faith-placed smoking cessation programs in the Appalachian Mountains	-Qualitative and Group Randomized Control Trial -Surveys and programs - 26 Appalachian churches recruited -590 participants -Churches were randomized to early or delayed intervention -Early intervention occurred promptly and delayed occurred after the 1 month post-intervention assessment -Each congregation set its own terms for the religious references -Baseline, 1 month post intervention and 6 months post intervention -First three weeks: kept record of cigarette smoking, free nicotine patches, and fellowship -22 in person interviews with church leaders, participants and intervention leaders	-Results of interviews: -Church leaders: programming brought people to church and serve as outreach -Participants: church setting was comfortable and increased feelings of accountability, no stigmas from church members, program's convenience orientation, financially available (reduced costs), no wait list compared to state programs, spiritual assistance, and fellowship -Although church leaders tried to eliminate any stigmas against smokers some smokers perceived stigmas was a barrier	- Appalachian Mountains has some of the greatest poverty rates -90% of Appalachian residents claim to have some sort of religious affiliation -Faith based vs. faith placed -IRB approved ->18 years old

		following program to evaluate success	-Successful cessation elements include: informal word of mouth, cost effectiveness, location in a comfortable area, and social support	
Walker et al., 2017	Purpose: Identify the relationship between pharmacotherapy and smoking cessation success rates. Compare the effectiveness of varenicline and nicotine replacement -Varenicline group vs. nicotine replacement group (NRT)	-Qualitative study -Data recorded on Quit 51 from March 2013-2016 -11 regions in England -4-week carbon monoxide-validated (primary outcome) and 12-week self-reported quit success/failure (secondary outcome) - Observed a total of 22,472 treatment episodes, 15,640 at the 4-week quit and 14,273 episodes at 12 weeks	-Varenicline was associated with higher success rates overall ($P<0.001$ at 4-weeks and 12-weeks; odd ratio varenicline vs. NRT=1.82 - Nicotine was prescribed almost three times more often than varenicline -Chance of quitting influenced by session setting, highest level of success seen in community setting at 4 weeks. 4 and 12 weeks, GP practice was worse than community setting -Men quit probability than women and percent of success	-Additional pharmacology, age, gender, ethnic group, nicotine dependence, and social deprivation was noted -Included 13-89 years -Vareniciline not given to <18 years old -Nicotine not given to pregnant women -Nicotine was prescribed almost three times more often than varenicline -Weakness: Only observational -IRB approved

			increased with age	
Stead et al., 2013	-Purpose: Review the effectiveness of physician advice to promote tobacco cessation -Minimal interventions vs. intensive interventions -Determine the effect of tobacco cessation advice on disease specific patients	- Used Cochrane Tobacco Addiction Group Trials registered in January 2013 - Advice given by medical doctor and abstinence assessed at least 6 months following initial advice -42 trials conducted between 1972 and 2012 with 31,000 patients -Most common delivery was in primary care	-17 trials showed that brief advice vs no advice increased rate of quitting -11 trials judged that intensive interventions were more effective - A brief intervention can increase quitting by 1 to 3% -Follow ups also may increase quit rates slightly	- Additional research in ways to develop strategies to increase the frequency with which smokers are identified and offered advice and support