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Authors	Pool-Krok-Horton, Kara E
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Motivational Interviewing for Smoking Cessation in Primary Care

Kara Elizabeth Pool-Krok-Horton

University of Massachusetts College of Nursing

DNP project Chair: Raeann LeBlanc, DNP, GNP-BC, AGPCNP-BC

DNP project Committee Member: Jean DeMartinis, PhD, FNP-C

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### Abstract

Smoking is hazardous to human health and continues to be devastating to a patient's physical health as well as to the entirety of the health care system. Smoking is both a public and personal health concern. The overall prevalence of tobacco dependence has decreased since smoking became a known health hazard, but it remains high in the general population as well as for the patients utilizing primary care in Rutland, Vermont. Nurse practitioners are holistic practitioners and are well suited to assist patients to change unhealthy behaviors. Behavior change, especially smoking cessation, is particularly difficult for patients. Motivational interviewing is an evidenced based method that has been extensively investigated to assist patients to overcome their tobacco addiction. This paper includes description of a Doctor of Nursing Practice (DNP) Project, health intervention, utilizing a motivational interviewing method to assist tobacco dependent patients in primary care. This project was based on the Transtheoretical Model of Health Behavior Change and principles of motivational interviewing utilized to assist patients to progress along the stages of change towards cessation. Data was collected to provide programmatic evaluation and an understanding of barriers associated with assisting tobacco dependent patients in primary care. This paper provides a review of recent literature about motivational interviewing for smoking cessation, a detailed description of the DNP project implementation, data collected during the implementation, analysis and implications of the data collected, as well as a plan for project sustainment.

**Keywords:** Motivational interviewing, smoking cessation, tobacco dependence, health behavior change

### **Introduction**

Despite local, regional, and national efforts, tobacco use remains prevalent in Vermont and nationally. In 2014, the Centers for Disease Control and Prevention (CDC, 2015) estimated that more than 40 million Americans are tobacco smokers and more than 30 million of these smokers smoke every day. One out of every 5 people in the United States will die as a direct result of smoking. Tobacco addiction is hard to overcome and results from a combination of both physiological and psychological processes (U.S. Department of Health and Human Services [USDHHS], 2010). Treatment of tobacco dependence, in all health care settings, needs to be a priority for all providers to reduce or prevent the consequences of smoking (Fiore et al., 2008).

### **Background**

Smoking is pervasive, addictive, and deadly. Fifty-one years ago, the Surgeon General released the landmark report declaring that smoking was hazardous to human health (USDHHS, 2014a). Since the release of this report smoking rates among adults have decreased from 43% to 18%. However, smoking remains prevalent. In 2012, 6.7% of middle school aged children and 23.3% of high school aged children were currently using tobacco products. In Vermont, 17% of those over the age of 18 smoke, and 13% of Vermont children grades 9 through 12 smoke (CDC, 2012; Vermont Department of Health [VDH], 2012). Locally, 18.8% of residents in Rutland County are current smokers and 14% of children grades 9 through 12 smoke (Rutland Regional Medical Center [RRMC], 2012). On a practice level, approximately 13% of the patients at the Doctor of Nursing Practice (DNP) implementation site smoke.

The combined efforts of providers and public health officials have resulted in great successes in combatting the tobacco epidemic but much more needs to be done. Tobacco use and addiction is a multifactorial disease resulting from psychosocial, environmental, and physiologic

influences. Those who smoke typically know or are related to someone who smokes (American Cancer Society [ACS], 2014). Nicotine addiction results from the pharmacodynamic properties of nicotine and from associative process that occur with tobacco use (USDHHS, 2010). There is also strong evidence to support that both initiation of smoking as well as a development of a nicotine addiction has a genetic component (USDHHS, 2010). Socioeconomic status also influences the initiation and continued use of tobacco products (Hiscock, Bauld, Amos, Fidler, & Munafo, 2012). Smoking prevalence is not only higher, but quit rates are also lower, in disadvantaged groups including those with low socioeconomic status. Patients that are uninsured, are below the poverty level, participate in Medicaid/Medicare, are unemployed, and those with a high school education or less are more likely to be smokers (Blackwell, Lucas, & Clarke, 2012; Center for Disease Control and Prevention [CDC], 2015). Additionally, smoking is influenced by a multibillion-dollar investment by the tobacco industry focused on advertisement, sales, and promotion (ACS, 2014). According to the Federal Trade Commission (FTC, 2013), the tobacco industry spent more than 8 billion dollars on advertising and promotional expenses in one year.

Smoking is known as a cause of multiple cancers, stroke, cardiovascular disease, and pregnancy complications, as well as several chronic diseases (Fiore et al., 2008). Smoking kills more than 6 million people worldwide and is the leading cause of preventable death (World Health Organization [WHO], 2011). By the end of the 21<sup>st</sup> century tobacco could be responsible for the deaths of a billion people (WHO, 2011). In the United States, smoking is the leading cause of lung cancer and lung cancer is the leading cause of cancer related death (USDHHS, 2014a). Annually, smoking is responsible for one out of every five deaths and more than 16 million Americans are coping with a disease that is directly related to smoking. Half a million Americans will die prematurely from smoking in a single year (USDHHS, 2014a).

Primary care providers have the responsibility and the opportunity to assess and treat tobacco dependent patients in primary care. Tobacco dependence encompasses the use of all tobacco products but smoking tobacco is the most common form of tobacco use, making smoking cessation a priority concern for primary care providers (Fiore et al., 2008). A Healthy People 2020 goal is to continue to reduce the illness, disability, and death associated with the use of tobacco products (USDHHS, 2014b). They hope to reduce tobacco use among adults to 12% or less by 2020. The framework for ending tobacco use includes encouraging and assisting tobacco users to quit. Additionally, the WHO (2013), panel members reported that primary care providers are on the front lines of the smoking epidemic and they need to assist patients in being successful in their cessation efforts.

### **Problem Statement**

Risk of morbidity and mortality from smoking is evidenced by the high smoking prevalence in the practice, locally, nationally, and internationally. This results from genetic predisposition, socioeconomic status, education level, having friends or family members who smoke, exposure to tobacco use in the media, tobacco product advertising, discounting of tobacco products, and nicotine addiction. Smoking is a known cause of lung cancer and is associated with several chronic diseases and other cancers. This risk of morbidity and mortality is further compounded by lack of desire to stop smoking, inability to stop smoking, as well as a lack of provider focus on treatment of tobacco dependence beyond brief advice (BA) or prescribing pharmacologic agents for smoking. Motivational interviewing is an evidence based method for addressing the problem of tobacco dependence in primary care.

### **Review of the Literature**

A comprehensive search of the literature for evidence addressing the use of MI in the treatment of tobacco dependence included the Cumulative Index of Nursing and Allied Health Literature (CINHAL), PubMed of the National Library of Medicine, and the Cochrane Database of Systematic Reviews. *Smoking cessation, motivational interviewing, tobacco dependence, and tobacco use disorder* were the key words or Medical Subject Headings (MeSH) used in the search alone or in combination. This search yielded 331 results published between 2008 and 2014. Three hundred and three articles were deleted for being duplicated in the search, lacking research designs, not addressing smoking cessation or tobacco dependence, not addressing motivational interviewing, or because they were not published in English. Twenty-three research articles, systematic reviews, and meta-analyses were retained for review. These 23 articles were then grouped according to topic.

## **Results**

Fourteen of the 23 articles selected for review were randomized control trials (RCTs). Four articles were systematic reviews, one was a meta-analysis, and three were a combination of the two. One study was quasi-experimental in design and one was non-experimental in design.

**Abstinence.** One RCT, one meta-analysis, one systematic review, as well as two combinations of systematic reviews and meta-analyses evaluated the effect of MI on smoking abstinence. The research on this topic was consistent. Heckman, Egleston, and Hoffmann, (2010), Hettema and Hendricks, (2010), Lundahl et al., (2013), as well as VanBuskirk and Wetherell, (2014), all found MI to be statistically more likely to assist a tobacco dependent patient to obtain abstinence than comparison or control groups. Hettema and Hendricks (2010) found that MI performed significantly better than comparison conditions at long-term follow-up as well as had higher mean abstinence rates at follow up. Hettema and Hendricks (2010) also



compared MI interventions to control or placebo, finding that MI produced significant effects at long as well as short term follow up. MI was also found to be effective at addressing other health behaviors as well (Lundahl et al., 2013; Prochaska et al., 2008; VanBuskirk & Wetherell, 2014). Only the study by Prochaska et al. (2008), found no significant differences between MI interventions and interventions based on the Transtheoretical Model of Health Behavior Change. This may be because these two interventions, while not based on one another, are in fact, quite similar in content and structure (Miller & Rollnick, 2009).

**Motivational interviewing compared to brief advice.** The results of single research studies comparing motivational interviewing (MI) and brief advice (BA) interventions for smoking cessation were also consistent. Colby et al. (2012), Prokhorov et al. (2008) and Audrain-McGovern et al. (2011) found no statistically significant differences in abstinence rates between MI and BA intervention groups with adolescent as well as young adult samples. Single research studies with adult populations also found no significant results (Davis et al., 2011; Lloyd-Richardson et al., 2009; Manuel, Lum, Hengl, & Sorensen, 2013; Okuyemi et al., 2013; Rohsenow et al., 2014). Conversely, Lindqvist et al. (2013) found that there was a significant difference in 6 month abstinence rates for those in the MI condition compared to standard treatment but no significant difference was found with 7 day point prevalence rates between the two groups.

Combined research articles were also consistent in their comparisons of MI and BA. However, these results contrast with the results of the single studies retained for this review. Hettema and Hendricks (2010), Lai, Cahill, Quin, and Tang, (2010), Lundahl et al. (2013), as well as all Stanton and Grimshaw (2013) found significant differences between MI and BA. Stanton and Grimshaw (2013) found that MI produced higher six-month cessation rates. Lai et

al. (2010) found that when MI was compared to BA, MI produced a significant increase in quit rates. When compared to wait listing, standard care, and information only intervention groups, MI had a greater chance of producing a positive outcome (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). Hettema and Hendricks (2010) found that MI performed significantly better than comparison conditions at follow up. Pelletier, Strout, and Baumann (2014) completed the only systematic review that did not find significant differences between interventions. Based on their review, there was no clear data that indicated the superiority of any smoking cessation intervention over another.

**Changes in attitudes and behaviors.** Nine RCTs addressed the effect MI had on smoking behaviors. Audrain-McGovern et al. (2011), Colby et al. (2012), Manuel et al. (2013), as well as Norman, Maley, Li, and Skinner (2008) all found significant reductions in smoking rates in the MI treatment group when compared to the standard treatment. Harris et al. (2010) also found that MI was effective at reducing the number of days smoked except for those that smoked very little at baseline. They also found that those who smoked more frequently in the MI condition had a greater reduction in the number of days they smoked (Harris et al., 2010). Two RCTs found no significant differences between MI and standard care groups in reducing the number of cigarettes participants smoked at follow up (Okuyemi et al., 2013; Rohsenow et al., 2014).

Two studies addressed *quit* attempts and found differing results. Harris et al. (2010) found that the odds of making at least one *quit* attempt were higher for those in the MI intervention group than in the control condition. Prokhorov et al. (2008) found that there were no significant differences between the group that received MI interventions and those that did not. Peterson et al. (2009) was the only study to address the effect of an MI intervention on the length

of time since the participants smoked their last cigarette and found that MI had a significant effect. Six research studies examined how interventions influenced attitudes and behaviors. Six studies found significant results for MI in regards to changing attitudes towards smoking. Manuel et al. (2013) and Rohsenow et al. (2014) found that there were no significant differences in motivation or desire to quit smoking between the MI condition and the comparison condition. Three studies addressed stages of change. Mujika et al. (2014) and Patten et al. (2008) found that participants in the MI intervention were more likely to progress to action-oriented stages. All of the participants in Battaglia, Benson, Cook, and Prochazka's (2013) study progressed through the stage of changes and as participants progressed, they reduced their daily cigarette use. Patten et al. (2008) found a significant percentage of patients in their study progressed through the stages of change or remained in the action stages at weeks one, two, and three. Norman et al. (2008) found that the MI intervention was related to a significant reduction in the likelihood of having intentions to smoke and high resistance to continued use at six months. Norman et al. (2008) also found that the MI intervention reduced the likelihood of heavy cigarette use adoption by non-smokers at six months.

### **Discussion and Synthesis of Evidence**

The evidence obtained in this literature review is consistent regarding the MI effect on smoking abstinence as well as significant differences between MI and BA. Single research studies with adult samples produced consistent results demonstrating that MI interventions were significant. Systematic reviews and meta-analyses reflect the highest level of evidence available because they combine results from multiple studies (Burns & Grove, 2009). High-level evidence produced consistent results indicating that MI is an effective intervention for smoking abstinence. No systematic review, meta-analysis, or combination of the two found insignificant

results regarding MI and smoking abstinence. Research comparing MI and BA were inconsistent. A majority of single research studies found no significant differences between MI and BA. Higher level combined research articles found more consistent evidence as well as found a significant difference between MI and BA with the exception of one systematic review, which found no significant differences. No systematic review found BA to be more effective than MI.

Inconsistent evidence was also obtained regarding the effect of MI on smoking attitudes and behaviors. A larger number of studies found that MI interventions were associated with a reduced smoking rate for participants. Variable results were also obtained when synthesizing evidence regarding quit attempts. Only two single research studies addressed quit attempts and they had conflicting results. This hinders the possibility of drawing strong conclusions regarding MI and cessation attempts. Several studies obtained significant results for MI treatment and changes in participant attitudes, indicating that MI may be effective at assisting patients change their attitudes towards smoking but, the results were inconsistent which limits the ability to draw strong conclusions about the effect of MI on the attitudes of smoking patients. However, the results regarding MI interventions and progression through the stages of change were consistent, which suggests that MI can influence patient change processes. This evidence was obtained from articles with the lowest rigor and control obtained for the review indicating limited generalizability, higher possibility for bias, as well as limited applicability to clinical practice without further research.

Fourteen of the articles in this review were RCTs. Common strengths of these articles included sound analytic techniques that were well described as well as explained in each article, randomization, and blinding of participants. Most of the studies included a treatment fidelity measure and ensured that the MI interventions were consistently delivered. This reduced the

likelihood of type II errors, increases the generalizability, and enhanced both internal as well as external validity of the studies (Burns & Grove, 2009). The majority of the studies lacked a power analysis to determine adequate sample size, many had loss to follow-up, several had small sample sizes, and many had limited external validity or generalizability. The nature of most MI interventions prevents the blinding of those implementing the intervention, which could have introduced bias. Also, the MI interventions varied significantly from study to study in terms of content, structure, size, and follow up making strong conclusions, recommendations, or generalizations about the effectiveness of MI interventions difficult. Since some of the studies mixed MI with other interventions it was also hard to isolate the significance of MI specifically in regards to the variables selected for review. It is recommended that future research focus on the above factors to provide stronger evidence.

Eight of the articles selected for review were the highest-level evidence because they combined results from multiple studies. These eight systematic reviews, meta-analyses, and combinations of the two were all methodologically strong. Their inclusion as well as exclusion criteria were well explained, biases were controlled for, and the results were presented accurately. Weaknesses of the combined research articles included under the powering of studies included, inability to isolate the effects of MI when MI is combined with other treatment modalities, possibility for publication bias, inconstant definitions of abstinence, and inconsistent confirmation of abstinence.

Overall, the results of this review indicate that MI is an intervention that can be efficacious in primary care and has been used in the literature as an effective method to assist patients to achieve smoking abstinence. The evidence base for MI is strong but more research needs to be completed to further illuminate the specific benefits and clinical implications of

incorporating MI into clinical practice. The results of this review indicate that a DNP project utilizing MI for smoking cessation is a reasonable, evidenced based approach to improve the health of tobacco dependent patients in primary care.

### **Theoretical Framework**

A theoretical framework is essential in DNP project development because it aids in both the conceptualization as well as supports the projects development, implementation, and evaluation (Zaccagnini & White, 2011). The Transtheoretical Model of Health Behavior Change (TTM) is a theory based on the processes of change patients experience when changing health behaviors (Prochaska, DiClemente, & Norcross, 1992). Motivational Interviewing (MI) is a client-centered approach to address behavior change and works within the patient's own motivation to change. MI is based on its own principals and practice elements (Miller & Rollnick, 2013). The TTM and the components of MI encompassed the theoretical base underscoring this DNP project that utilized MI as an intervention to enhance smoking cessation in primary care.

### **The Transtheoretical Model**

The TTM was developed in the early 1980's at the same time MI was developed (Miller & Rollnick, 2009). The TTM started with research with smokers attempting to understand how people change their behavior independently, and progressed to exploring how change activities could be measured as well as trying to understand if identifying common elements could assist with the prediction of maintenance in cessation efforts (Prochaska, DiClemente, & Norcross, 1992; Werch, Ames, Moore, Thombs, & Heart, 2009). Over time, DiClemente and colleagues have progressed from smoking cessation to evaluating other health behavior topics including alcohol use, diet, exercise, sun protection, condom use, mammography screening, medication

adherence, stress management, substance abuse, and many others (Prochaska, Norcross, DiClemente, 2007; Redding, Rossi, Rossi, Velicer, & Prochaska, 2000; Werch et al., 2009).

**Stages of change.** According to DiClemente and Prochaska (1998), the stages of change, of the TTM, represent processes of behavior change and segment the overall change process into meaningful steps. Each stage of change contains specific tasks that are required to achieve successful and sustainable behavior change. Stages of change also represent an arrangement of attitudes, intentions, and behaviors that are significant to an individual's progression in the process of changing his or her behavior (Prochaska et al., 1992). According to Redding et al. (2000) individuals do not progress linearly through the stages of change. They often progress and then regress back to a previous stage before making greater progress (see Appendix A for figures depicting the TTM stages of change).

There are five stages of change in the TTM. The first stage is the precontemplation stage. This stage can represent a variety of individuals with differing attitudes towards change (Prochaska et al., 2007). Many in this stage will not view their current behavior as problematic or in need of change (DiClemente & Prochaska, 1998). Some will even be committed to continuation of the problematic behavior and most in this stage will avoid thinking, reading, as well talking about their behavior (Redding et al., 2000; Prochaska & Velicer, 1997) Individuals in the precontemplation stage have no intentions of changing their behavior in six months (DiClemente & Prochaska, 1998; Prochaska & DiClemente, 1992; Prochaska & Velicer, 1997). The second stage is the contemplation stage. In this stage individuals are actively considering change and are considering changing their behavior within the next six months but have yet to commit to action. Those in the contemplative stage struggle with the positive aspects of current behavior continuation and the struggle, effort, as well as the risk required to make a change

(Prochaska et al., 1992; DiClemente & Prochaska, 1998). This ambivalence is the hallmark of the contemplation stage (Redding et al., 2000; Tomlin & Richardson, 2004). Individuals in the preparation stage have resolved to take action to change their behavior (DiClemente & Prochaska, 1998; Prochaska, & DiClemente, 1992). Those in the preparation stage will take action in the near future, most often within the next month and/or have taken action unsuccessfully within the past year (Prochaska, & DiClemente 1992; Prochaska et al., 1992). Individuals in this stage have learned from previous attempts at changing their behavior and have committed to an action plan. Some may have begun to make small changes or reductions in their behavior already. The action phase includes individuals that have changed their behavior in the last six months (Redding et al., 2000). During this phase individuals actively engage in modification of their behavior, experiences, and their environment to overcome their problematic behavior (Prochaska et al., 1992). Individuals in the action phase are prone to relapse and need support to prevent this (Prochaska & DiClemente, 1992).

The remaining stages are the maintenance and the termination phases. The maintenance phase begins when successful action has been maintained for six months (DiClemente & Prochaska, 1998; Redding et al., 2000r). Individuals in the maintenance phase are more confident, have to apply change processes less frequently than in other stages, and their behavior change is becoming more of a habit (Prochaska & Velicer, 1997; Redding et al., 2000). Individuals in this phase are not static and must actively continue to work at preventing relapse (Prochaska et al., 2007; Redding et al., 2000). Termination is the ultimate goal for behavior change and this phase represents the absence of risk for relapse as well as lack of temptation (Prochaska & Velicer, 1997; Prochaska et al., 2007). Patients in the termination stage have



complete self-efficacy. During this phase, the problem behavior is thought to be resolved, and the original behavior is no longer a part of the individual's thought process.

***Processes of change.*** Processes of change are the specific activities individuals engage in while progressing through the stages of change (Prochaska et al., 2007). DiClemente and Prochaska (1998) state that processes of change are the facilitators of movement through the stages of change. Processes of change include cognitive, emotional, behavioral, and interpersonal methods that are utilized by the individual as well as those assisting individuals to change behavior (Redding et al., 2000). Consciousness raising is the first of the 10 processes of change. It involves increased awareness of the causative factors, consequences, and strategies to address problem behaviors (Prochaska & Velicer, 1997). Social liberation is the recognition of societal changes and social norms supporting a desired behavior change (Tomlin & Richardson, 2004; Redding et al., 2000). Self-reevaluation is a combination of both cognitive and affective assessments of individual self-image with and without the problem behavior (Prochaska & Velicer, 1997). Emotional reevaluation includes affective and cognitive realizations of how an individual's problem behavior impacts others (Redding et al., 2000; Prochaska & Velicer, 1997). Dramatic relief is the process of change that encompasses the negative emotions that accompany problematic health behaviors (Redding et al., 2000). Self-liberation involves the commitment to change behavior and creation of a plan to do so (Redding et al., 2000; Tomlin & Richardson, 2004). Helping relationships is the identification and utilization of social support for behavior change (Redding et al., 2000; Prochaska et al., 2007). Another change process is counter conditioning, which involves the replacement of the unhealthy behavior with a healthy behavior and thoughts (Redding et al., 2000). Reinforcement management involves rewarding of engaging in the healthy behavior while reducing the rewards for the undesired behavior. Finally, stimulus

control is removing the temptation or stimulus to engage in the unhealthy behavior while adding cues to engage in the healthy behavior.

***Decisional balance, situational confidence, and temptation.*** In the TTM, decisional balance refers to contemplation of the pros and cons of changing behaviors (Prochaska & Velicer, 1997; Redding et al., 2000). Decisional balance includes the importance of the reasons an individual has for changing or not changing and relate directly to the stages of change (Redding et al., 2000). Progression from one stage to the next is based on the relative importance a person places on the pros and cons for adopting a new, healthier, behavior. According to Redding et al. (2000), decisional balance is a clear indicator of the decision to progress from the precontemplation stage.

Situational confidence is based on self-efficacy, which was first introduced by Bandura (1991) in his Social Cognitive Theory. According to Bandura (1991), self-efficacy includes a person's own beliefs about their ability to self regulate. According to Prochaska and Velicer (1997), self-efficacy in the TTM involves how individuals cope with different situations without relapsing. Temptations are of equal importance to self-efficacy or situational confidence. Temptations involve an individual's urge or desire to engage in a specific habit (Prochaska & Velicer, 1997). Confidence and temptations have an inverse relationship in the TTM (Redding et al., 2000). Confidence tends to increase as a person progresses through the stages of change while temptation tends to be high in the early stages and wanes as a person progresses.

Overall the TTM outlines the steps a person needs to go through to complete behavior change. The processes of change outline the specific activities and thought processes that occur while patients are engaging in the different stages of change. The processes of change assist patients to progress to the next stage of change. Decisional balance in the TTM represents the

individual's evaluation of both the pros and cons of change. As a person progresses through the stages of change and utilizes the processes of change, they build self-efficacy, which provides them with the confidence they need to overcome the temptation to continue a behavior that they need to change. In this DNP project, the TTM stages of change were used to identify needed interventions to assist the patient to quit smoking. The processes of change were combined with MI interventions to assist the patient's progress along the stages of change as well as to build self-efficacy. Understanding the decisional balance assisted the DNP student understand what motivates each patient to change their behavior.

### **Motivational Interviewing**

It is a common misconception that MI is based on the TTM. However, both theories were developed in the 1980's (Miller & Rollnick, 2009). According to Miller and Rollnick (2009), development of the TTM helped to create the understanding that most people in treatment are not yet committed to change and debunked the myth that patients lack the motivation needed for change. While the TTM was not the basis for the development of MI, the TTM provides the conceptual model of understanding change processes, which is essential for applying MI. MI can be used as an intervention for patients in each of the TTM stages of change (Miller & Rollnick, 2002).

MI is a patient centered and collaborative approach to address behavior change and works by utilizing a patient's own motivation for change (Miller and Rollnick, 2013). MI was developed for clinical use in 1983 and was used as a brief intervention for problematic drinking (Rollnick, Miller, & Butler, 2008). It was researched in the 1990s for a variety of health conditions in which behavior change is an essential component. MI has been well researched and

found to be successful in treating a variety of health problems including cardiovascular disease, diabetes, smoking, overweight/obesity, hypertension, psychosis, gambling, as well as HIV.

**Elements of motivational interviewing.** There are four elements that are interrelated that are the core of MI which include partnership, acceptance, compassion, and evocation. Each of these four elements has an experiential and behavioral component. The first element is partnership. Partnership involves mutual respect and awareness, which represents the collaborative process between the patient and the provider. Acceptance involves four additional concepts including: absolute worth, autonomy, accurate empathy, and affirmation. Absolute worth involves valuing and understanding the worth as well as the potential of every human. Accurate empathy includes actively attempting to understand another person's perspective and understanding an individual's personal perspective. Autonomy support involves recognizing, respecting, and valuing another person's right as well as ability to self-direct. The final component of acceptance is affirmation, which includes acknowledgement of an individual's strengths, work, and effort. Compassion is a new core element in the latest editions of MI texts. Compassion involves putting an individual's needs before your own and to promote a person's welfare. Evocation involves activation of an individual's own resources and motivation for change (Miller & Rollnick, 2013; Rollnick et al., 2008).

**Processes of motivational interviewing.** Engaging, focusing, evoking, and planning are the four processes of MI. Each of these four processes overlap but also typically emerge in sequence and build on each other. Engagement occurs at the start of a therapeutic relationship and is the establishment of a connection and a working relationship. Engagement leads to focusing, which involves the development and maintenance of direction when talking about change. Focusing clarifies direction and reveals goals for change. Once goals are identified, the

third process of MI, evoking is initiated. Evoking involves the utilization of the client's ideas and feelings about change as well as elicits the patient's own personal motivation for changing. Evoking, or the process of drawing out an individual's motivation for change, is considered the centerpiece of MI. Planning is the final process of MI and includes both fostering a commitment to changing behavior as well as creating a plan to accomplish behavior change. Using open ended questions, affirming, reflecting, summarizing, and providing information and advice with permission are the communication skills that MI practitioners use along with the processes of MI to assist patients to change their behavior (Miller & Rollnick, 2013).

**Guiding principles.** MI is based on four guiding principle. Resisting the righting reflex is the first of these four principles and involves the natural inclination that health practitioners have to tell those who are engaging in unhealthy behaviors to stop. This natural inclination can have the opposite effect as humans, especially those who are ambivalent about needed change, have a natural tendency to resist persuasion. The second principle is understanding what motivates the patient because behavior change is more likely when working within an individual's personal motivations. Listening to the patient is another guiding principle of MI. MI is based more on listening and understanding individual patients than the provision of information. Empowerment is the final principle of MI and involves assisting patients to explore how they can change their own behavior to improve their health (Rollnick et al., 2008).

### **Application of Theoretical Constructs to DNP Project**

The TTM and MI theoretical base are effect theories. According to Issel (2014), effect theories are the part of a program theory that addresses interventions and their outcomes. Effect theories explain how interventions within a health program affect causal, moderating, and/or mediating factors of a health program. The TTM as well as MI core elements, principals, and

processes were used to guide the delivery of a MI smoking cessation intervention at a primary care clinic in Rutland Vermont.

Basic MI training and advanced MI training was completed by the DNP student (see Appendix B for evidence of training completed). The DNP student then used the knowledge acquired with the training along with research about both MI and the TTM to implement the DNP project intervention with patients at the primary care practice. The elements of partnership, acceptance, compassion, and evocation were used as guiding principles for the intervention. These elements were also used to establish relationships with participants and assisted them to progress along the stages of change. MI was used as a patient-centered intervention to evoke a patient's own motivation for change. The MI process of engaging was used to foster relationships with patients, help patients discover their individual goals for change, and assist them in developing a plan for changing their behavior. MI tools including open-ended questions, affirming, reflecting, summarizing, as well as giving advice with permission were utilized in motivational interviewing sessions to assist patients to change their smoking behavior. The guiding principles including resisting the righting reflex, understanding individual motivation, listening, as well as empowerment were used to facilitate the development of self efficacy, a TTM theoretical concept, and to assist progression towards behavior change.

Assessment of project participant's stage of change was completed at each MI session visit using a standardized assessment tool (see Appendix C for this assessment tool). The results of this assessment were used to drive the DNP project intervention. Understanding the patient's stage of change helped to frame the structure of the patient-centered MI intervention. Once a patient's current stage of change was identified, TTM concepts, MI theoretical concepts, and MI skills were combined to complete MI sessions with the DNP project participants.

## **Project Design and Methods**

### **Population and Setting**

The target population for this DNP project was smokers at the primary care clinic selected as the implementation site. The DNP project implementation site serves as a primary care practice that sees patients 14 years of age and older. The practitioner in this primary care practice also provides chronic pain management to many of her patients.

**Description of the population and community.** The DNP project implementation practice site is a Nurse Practitioner (NP) owned and operated primary care office. The office is small, and employs three staff members in addition to one provider. There are two licensed nursing assistants responsible for patient check in, vital signs assessment, answering the phone, and updating electronic medical records (EMRs).

The DNP project implementation site was located in Rutland Vermont. Rutland is Vermont's second largest city and located in Rutland County. Rutland County is mostly rural and the second largest county in Vermont. In 2013 the population of Rutland County was 60,622. Four point six percent of the population was under the age of 5, 18.4% were under 18 years of age, and 18.7% were 65 and older. Ninety seven percent of Rutland County residents are Caucasian, 0.6% Black or African American, 0.3% Alaskan Native or American Indian, 0.7% Asian, 1.4% identified as more than one race, and 1.3% were Hispanic or Latino. The median household income from 2009-2013 was \$49,217 and in 2013, 13.0% of the population of Rutland County was below the poverty level (United States Census Bureau, 2015).

The majority of the patients using the project implementation site were Caucasian with very few identifying as another race or ethnicity. Many of the patients also utilize this office for chronic pain management as well as primary care. Most patients are middle-aged and are

medically complex with multiple co-morbidities. Approximately 30% of the patients at the implementation site are of low socioeconomic status. Thirty percent of the patients are on Medicare, 30% receive Medicaid, 30% are privately insured, and the remaining 10% are uninsured or currently have an unknown insurance status (S. Dumas personal communication, February 20<sup>th</sup>, 2015).

The provider at the DNP project site sees six to ten patients per day for forty-five minutes to an hour. The DNP student has observed that the majority of the patients are middle-aged and a large portion of the patient population suffers with chronic pain conditions. Many patients also have complex psychosocial and living situations. The provider sees on average, one to four actively smoking patients per day.

### **Design**

This DNP project was designed as a quality improvement initiative with the intent of implementing an evidenced-based intervention, MI, into a practice. The purpose of implementing this quality improvement intervention was to improve the care of tobacco dependent patients at the project site as well as encourage sustainment of the intervention by the DNP project site provider. This project was accomplished by recruiting patients, utilizing MI techniques during smoking cessation counseling visits, collecting data about the intervention, creating a educational resource in the form of a website for the implementation site provider, and assessing her willingness to agree to interventions recommended based on information gathered during the implementation process.

**Sampling method, participant selection, and inclusion criteria.** The sampling method selected for this DNP project was convenience sampling. Pamphlets were placed at the project intervention site to advertise the MI for smoking cessation program. Additionally, patients were



recruited by the implementation site provider and the DNP student during primary care visits. The ancillary staff at the intervention site were also encouraged to recruit patients identifying as a current smoker and schedule them for an appointment with the project leader. The intervention period started in October, 2015. After more than two weeks with only one patient agreeing to participate in the intervention, but never making an appointment, it was decided to change the recruitment approach. The implementation site provider felt that many patients were not interested in the intervention because they did not want to come back to the office for another appointment. For the remainder of the intervention, recruitment was accomplished by the DNP student making herself available one day a week at the implementation site. The DNP student would remain at the implementation site until the end of the day or until the DNP project mentor could review the schedule and indicate that the rest of the patients being seen that day were known to be non-smokers. The implementation site provider would see scheduled patients for primary care and those that identified as smokers would be asked if they would like to participate in the program. Patients who agreed would then immediately meet with the DNP project student. Additionally the DNP student continued recruitment during practicum days at the DNP project implementation site. The provider and the staff at the DNP project site were also encouraged to recruit patients for the intervention. However, only one patient was recruited by primary care staff and this person did not participate in the intervention.

**Goals, objectives, and expected outcomes.** The following table outlines the goals, objectives, and expected outcomes for this DNP project.

**Table 1**

*Goals, Objectives, and Expected Outcomes*

Goal: Patients interested in a smoking cessation program using MI will be contacted and enrolled in the program
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Objectives	Expected Outcomes
Patients will be recruited for participation in the DNP project through advertisements at the implementation site, visits with the practice NP, and/or visits with the DNP student	100% of the patients that express interest in the DNP project will be enrolled in the project 70% of those asked to participate will attend
Goal: Patients that participate in the MI for smoking cessation DNP project will progress towards cessation and will be satisfied with the MI interventions	
Patients will progress from or remain in their current stage of change	Repeated measures will demonstrate group progression along the stages of change. 50% of patients will progress along the stages of change or will not regress to an earlier stage of change at the end of the project.
Patients in the smoking cessation group will quit smoking or will reduce their cigarette consumption	25% of patients will stop smoking or will reduce their cigarette consumption by the end of the implementation phase of the DNP project.
Patients will complete a post-intervention survey with qualitative and quantitative elements	100% of patients will complete the post-intervention survey Quantitative analysis will demonstrate that 70% of the participants expressed satisfaction with the DNP project on Likert scale items 50% of the patients will describe elements of the program that they enjoyed during qualitative analysis
Goal: The DNP project will be sustainable	
An educational packet will be created by the DNP student based on data obtained during project implementation and evaluation phases	The sole provider at the DNP project implementation site will state that she received this packet and will agree to use at least 4 of the recommended interventions

**Fidelity.** MI sessions with DNP project participants were tailored to the patient's current stage of change and needs at every visit. Therefore, no two MI sessions were alike. The literature discussing the length and number of sessions needed to produce significant results when utilizing MI for smoking cessation is small and inconclusive. Lundahl et al. (2010) found that when MI was compared to weak comparison groups and shorter interventions, there was a significant positive relationship. This could indicate that more treatment was related to better outcomes with MI interventions. Lai et al. (2010) found that sessions lasting longer than 20 minutes may be more successful than other interventions but the results had overlapping confidence intervals,

which might suggest that the results were not significant. Conversely, VanBuskirk and Wetherell (2014) found that the total time of clinical contact was not a significant moderator of effect size among all substance abuse subgroup analyses. Further, a review by Heckman et al. (2010) found no evidence that studies that include fidelity measures of MI interventions for smoking cessation had different effects on abstinence than those that did not include these fidelity measures.

With the evidence available for review, the DNP student chose to make MI sessions approximately twenty minutes or longer in length and to follow up with patients as frequently as their schedule would allow with the goal of meeting patients on a bi-weekly basis. Most sessions completed were twenty minutes or longer. However, one session during the implementation period was shorter due to patient need. Two MI sessions after the intervention period were also less than 20 minutes because of patient time constraints. The goal of meeting patients on a bi-weekly basis was often not met. Patient illness, scheduling conflicts, office closures, and holidays often interfered with bi-weekly sessions. There was no treatment fidelity measure for this project. Some studies evaluating MI interventions utilize coding to ensure treatment fidelity. This was not completed because tape recordings would need to be submitted to a professional MI coding specialist. Completing coding assessment of MI interventions would have been both cost and time prohibitive. Also, submitting audio or video recordings of patient visits to a MI coding specialist would have violated the DNP student's human subjects determination application filed with the University of Massachusetts Amherst.

**Data collection and programmatic evaluation.** Data was collected throughout the DNP project implementation period. Each patient visit began with an assessment of the patient's current stage of change using a standard survey (see Appendix C for a copy of this assessment tool). The average daily consumption of cigarettes and the number of patient quit attempts was

also obtained at each visit to evaluate the effectiveness of the intervention as well as evaluate reduction of harm. Data was also collected about adjunct interventions used to assist smokers participating in the project to quit. To evaluate achievement of goals and objectives the number of patients expressing interest in the program as well as those that were offered participation were also recorded. Since, patient participation in the intervention was low, data was also collected identifying why patients wanted to join the program or why they refused to join the program. Participation data was also collected. This included patients that expressed interest but did not make their appointments, no shows, and reasons for not completing the project. At the end of the four month data collection period, patients completed a survey evaluating their satisfaction with the program. A post-intervention interview with the DNP project site provider was also completed to evaluate her perspective on the project.

**Sustainment.** To ensure sustainment of the intervention at the DNP project site, a website was developed as a provider resource based on the implementation of the DNP project. This website can be found at: <https://miforquitting.wordpress.com/>. This website contains general provider resources for implementing MI interventions in primary care, patient resources for smoking cessation, as well as specific recommendations for the implementation site. A website was created as an educational resource that could be accessed at any time for the implementation site provider. A website was also developed because the DNP project site provider uses a web-based electronic medical record (EMR), and therefore, she can access this website during patient visits. An orientation to this website was completed with the provider at the implementation site and evaluated by her during the post-intervention interview.

### **Ethics and Human Subject Protection**

All quality improvement activities should be completed ethically and with planned ethical safeguards in place. Ethical problems occur when quality improvement efforts inadvertently cause harm, waste resources, or affect patients unfairly (Lynn, et al., 2007). This DNP project was an evaluation of the success of a quality improvement project and was not a formal research endeavor. There was minimal risk to the patient if they participated. The University of Massachusetts Institutional Review Board (IRB) was consulted before implementation. Their application states that quality improvement activities that are created, to improve current processes, in health care settings in which the intent is not to generate conclusions that can be applied universally outside of the immediate environment, where the project occurred, are exempt as long as these activities do not involve randomization into different treatment groups. This project was implemented only to improve the care of tobacco dependent patients at the implementation site and to evaluate improvement in care. There was no randomization into different treatment groups. Therefore, IRB approval was not required to complete this DNP project (see Appendix D for evaluation of the project by the University of Massachusetts Human Research Protection Office).

This DNP project met or exceeded ethical standards for DNP projects. This project was based on high-level clinical evidence. There was a favorable risk-benefit ratio because there were no identifiable risks to the patients that participated. There was also no greater risk to the participants than those that received BA for smoking cessation, or the current standard of care. This project was also fair because all patients interested in participation were given the opportunity to do so.

This project also respected and upheld standards for patient privacy as well as confidentiality. The EMR was not used to collect any patient data nor was it used for information

gathering of any kind. All assessments and surveys were collected as well as coded to ensure that there was no patient identifying information on data collected. A non-identifiable numeric coding system was used for data comparisons from visit to visit. All material kept by the DNP student was free of any patient identifying information. All data collected for the DNP project was locked in a filing cabinet in the DNP student's home or in private storage at the implementation site. Once all patient data was entered into the computer, the originals were disposed of in a Secure Shred locked box where they were shredded according to current privacy laws. Dissemination of the results of the DNP project will be done without disclosing the patient's identity or medical information. Additionally, all patient participants signed a disclosure indicating that they have been educated about how their privacy was protected during the project (see Appendix E for a copy of the informed consent form). With these safeguards in place, no violation of the provisions in the Health Insurance Portability and Accountability Act was perpetrated (HIPPA; Lynn et al., 2007).

## **Results**

### **Recruitment**

Recruitment was accomplished through eleven visits to the DNP site during the four month implementation period. A total of 20 different patients were approached during these eleven days for participation in the DNP project. Additionally, the implementation site staff and the provider at the DNP project site were encouraged to recruit any patients self-identifying as a smoking patient. However, only one patient was recruited in this way and she failed to show for her appointment and did not respond to follow up calls. Four patients were approached twice for their participation, and one patient was approached three times. A total of 50 pamphlets were placed at the implementation site. The DNP student was able to get 15 patients to accept these

pamphlets. At the end of the implementation, there were 23 pamphlets advertising the project remaining at the implementation site. Therefore, an additional 12 were handed out, however no patients were recruited this way.

The recruitment goal of this DNP project was to enroll all patients interested in a smoking cessation program using MI. The expected outcome was that 100% of the patients that expressed interest in the DNP project would be enrolled in the project. This goal was not met. One patient was not offered the MI intervention a second time. This was because the patient has previously agreed to the intervention but later declined to participate citing that the intervention was “more than an hour and a half from my home”. During this visit, the patient also had several significant and complex complaints that took precedent over offering the MI intervention. It should be noted, however, that 96% of the patients identifying as a smoker were offered the intervention. Another goal was to have 70% of patients that were referred to the program or asked to participate, agree to participate in the intervention. This goal was not met. Only 19% of all patients invited to attend the DNP project enrolled in the program and only one patient completed the program (see Table 2, Recruitment Data).

**Table 2**

*Recruitment Data*

Date	Number of Pts. Self Identifying as a Smoker	Number of Patients MI Intervention Offered	Number of New Patients Offered MI Intervention	Number of Patients Who Agreed to Participate	Number of Patients that Declined to Participate	Percentage of Smoking Patients for Whom Interventions Were Offered	Percentage of Patients that Agreed to Intervention	Percentage of Patients Declining to Participate
10/9/15	5	5	5	2	3	100%	40%	60%
10/16/15	2	2	2	0	2	100%	0%	100%
10/23/15	4	4	4	0	4	100%	0%	100%
11/6/15	5	5	2	0	5	100%	0%	100%
11/12/15	2	2	2	1	1	100%	50%	50%
11/19/15	2	1	1	1	0	50%	100%	0%
11/20/15	1	1	0	0	1	100%	0%	100%
12/11/15	1	1	1	0	1	100%	0%	100%
12/17/15	1	1	1	0	1	100%	0%	100%

1/8/16	1	1	1	0	1	100%	0%	100%
1/14/16	1	1	0	0	0	100%	0%	100%
1/18/16	1	1	1	1	0	100%	100%	0%
<b>Totals</b>	<b>26</b>	<b>25</b>	<b>20</b>	<b>5</b>	<b>19</b>	<b>96%</b>	<b>19%</b>	<b>81%</b>

### Enrollment

A total of five patients were enrolled into the MI for smoking cessation health intervention. Each patient was offered the program only once before agreeing to participate. Each patient was offered an appointment and each accepted. One hundred percent of patients expressing interest in the program were enrolled. However, two patients did not participate in the program. Three patients with interest participated in the intervention (see Table 3, Enrollment Data).

**Table 3**

#### *Enrollment Data*

Date	Number of new patients interested in program	Patient Code	Number of patients Now enrolled in the program	Percentage of patients who are interested that are enrolled	Did patient participate?
10/9/15	1	N/A	1	100%	NO
10/9/15	1	0001	1	100%	YES
11/12/15	1	0002	2	100%	YES
11/19/15	1	0003	3	100%	YES
1/14/16	1	N/A	4	100%	NO

### Participation and Demographics

A total of three patients participated in the DNP project. All three patients were female and all three were middle aged. All had been smoking for more than 10 years and none had made a quit attempt in the past year. All three patients also suffer from a chronic pain condition, which is being treated at the implementation site. Also, two out of the three patients live with a person who also smokes and all three patients smoked in their residence. All patients have friends and



relatives that smoke. One patient started the program smoking 10 cigarettes per day, another smoked more than 40 per day, and the third smoked 20 cigarettes on an average day. One patient completed the program from start to finish, one patient only had one visit, but did present to the office after the data collection period for follow up, and one patient declined further participation after her second visit.

### **Stages of Change and *Quit Attempts***

None of the three participants in this DNP project made a *quit* attempt during the intervention period. However, all three patients described during the visit that they have made unsuccessful *quit* attempts in the past. All three patients that enrolled in the DNP project started in the contemplation or pre-contemplation stages.

All three patients progressed through the stages of change during MI for smoking cessation visits. Patient 0001 was the only patient that completed the intervention. She started the first visit in the contemplation stage. She then progressed and remained in the preparation stage for four visits until the end of the intervention period. Smoking cessation visits have been continued with this patient after the end of the implementation period with permission from the DNP project site provider. Since the end of the intervention period, she has progressed from the preparation stage to the action stage. Since the end of the intervention period, Patient 0001 has developed a *quit plan*, which she plans to implement in the next month. Patient 0002 completed two visits and started in the pre-contemplation stage. She declined further participation after progressing to the contemplation phase. Patient 0003 only completed one visit starting in the contemplation phase and ending in the action phase. After the intervention, this patient remains in the action phase and has not made a *quit* attempt.

This DNP project had the goal of repeated measures demonstrating group progression along the stages of change. It was expected that 50% of the patients will progress along the stages of change or would not regress to an earlier stage of change by the end of the implementation period. This goal was achieved and 100% of the patients enrolled in the intervention progressed or remained in their current stage of change as demonstrated by repeat measure. All patients made some progression through the stages of change and no patient regressed during the implementation period. Many patients made progress through the stages of change during one visit (see Table 4, Stage of Change Data).

**Table 4***Stage of Change Data*

Patient Code	Visit Number	Date	# of Cigs smoked/day	Visit length	Stage of Change at start of MI sessions	Stage of Change at End of MI sessions	Smoking Cessation Aids Prescribed	Has the Patient quit smoking?	Number of cessation attempts
0001	1	10/22/15	10	30 minutes	Contemplation	Preparation	14 mg nicotine patches Nicatrol inhaler	NO	0
0001	2	12/11/15	7 or less	20 minutes	Preparation	Preparation	None	No	0
0001	3	1/8/16	7 or less	15 minutes	Preparation	Preparation	None	No	0
0001	4	1/28/16	5 or less	20 minutes	Preparation	Preparation	None	No	0
0001	5	2/5/16*	3 or less	15 minutes	Preparation	Action	None	No	0
0002	1	11/12/15	40+	30 minutes	Pre-contemplation	Pre-contemplation	None	No	0
0002	2	12/11/15	40+	30 minutes	Pre-contemplation	Contemplation	None	No	0

0003	1	11/19/15	20	30 minutes	Contemplation	Preparation	21mg patches Niacetrol inhaler	No	0
0003	2	2/19/15*	5	15 minutes	Preparation	Action	None	No	0

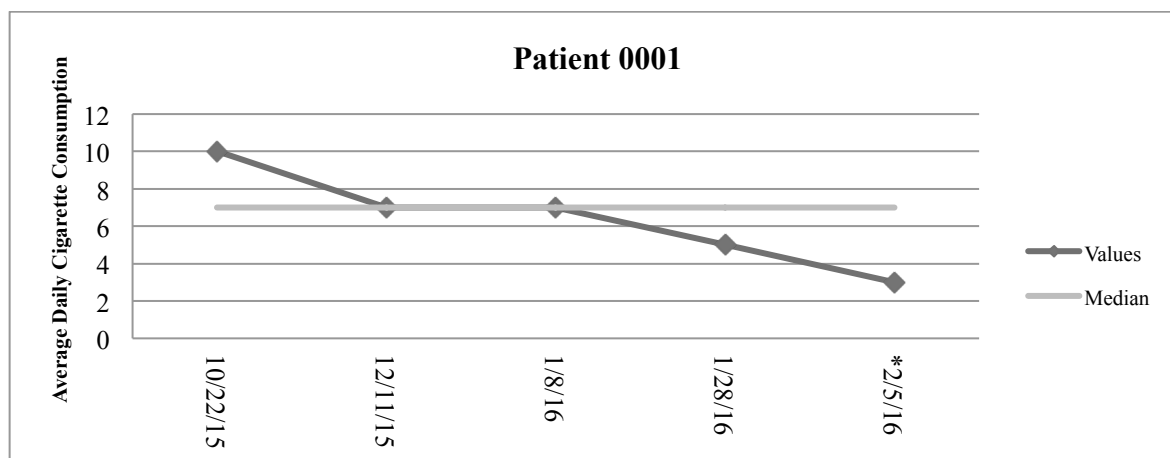
\* Smoking cessation appointments that have occurred after the intervention period concluded

## Reduction in Cigarette Consumption

The average daily cigarette consumption for each patient was also assessed at every visit. Patient 0001 reduced her daily smoking rate from 10 to 5 or less by the end of the intervention period. After the intervention period, she reduced her daily use to 3 cigarettes or less. During the intervention period Patient 0001 would set her own goals for cigarette reduction and was able to meet these goals consistently, which increased her confidence in overcoming her addiction and built self-efficacy. This patient reduced her consumption between four of the five MI for smoking cessation visits (see Figure 1, Patient 001 Cigarette Consumption Reduction).

**Figure 1**

### *Patient 001 Cigarette Consumption Reduction*

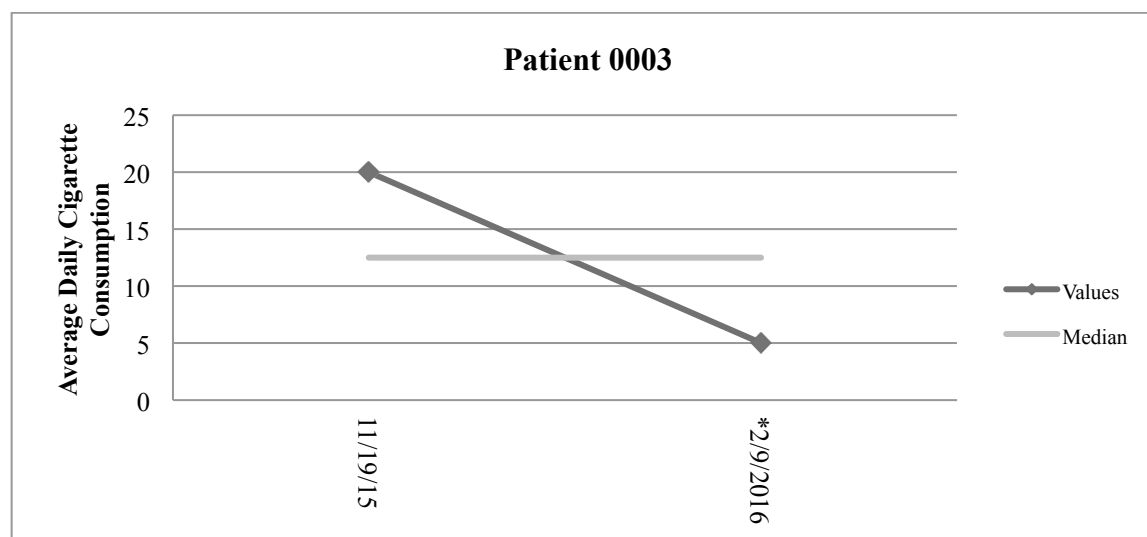


\* Data collected after implementation period

Patient 0002 did not reduce her consumption at all during the intervention and declined further participation before any reduction in use could be observed. Patient 0003 started the MI for smoking cessation program smoking 20 cigarettes per day and did not follow up despite repeated attempts to get in contact with her during the implementation period. After data collection was complete, she did return to the office to discuss smoking cessation and she had reduced her average cigarette usage to five cigarettes per day (see Figure 2, Patient 003 Cigarette Consumption Reduction).

**Figure 2**

*Patient 0003 Cigarette Consumption Reduction*



\* Data collected after implementation period

A goal of this DNP project was for patients to be successful at smoking cessation or reduce their cigarette consumption. An expected outcome was that 25% of patients would quit smoking or reduce their cigarette consumption. No patient quit smoking during the intervention period. However, 66% of patient participants did reduce their cigarette consumption. It should be

noted, however, that only 33% of patients in the intervention group completed this reduction during the implementation period and the sample size was very small.

### **Patient Acceptance of the Intervention**

Qualitative data was also collected from participants in the intervention as well as those that consented to participate, but did not actually partake in the DNP project, because depth of description is essential to gain a detailed understanding of what motivates patients to participate in smoking cessation interventions. Since the number of patients that agreed to the intervention was small (5), most answers were unique. However, common themes in choosing to participate were the participant's concern for their health, costs related to smoking, and environment.

**Health.** One patient stated, "I want to quit smoking because I am sick all the time". Another patient stated, "I want to quit smoking because I know that I will feel better".

**Cost.** Other patients had more specific and practical concerns. One stated that, "I smoke too much and I can't afford to continue smoking".

**Environment.** Environmental concerns were also described. One patient expressed, "I am moving and I don't want to smoke inside of my new home".

### **Patient Declination**

Qualitative data was also collected about the reasons for not participating in the DNP project intervention. Several common themes were revealed.

**Time.** Several patients cited time as a barrier to participation. One patient stated, "I have cancer and have too much stress to think about quitting right now." Others stated, "I have too many appointments right now" and "I don't have time". Another said, "I have so many other things going on that I don't have time to concentrate on quitting smoking." Others also indicated

that making time for additional appointments during the intervention period was not possible stating, “I have too many appointments, and I don’t have time to concentrate on quitting” as well as “I can’t make time for smoking cessation appointments.”

**Lack of readiness to quit.** Others reported a lack of readiness and several others cited stress as a barrier to smoking cessation. Statements indicating a lack of readiness included “I don’t want to quit”, “I am not ready to quit smoking”, and “I was told I don’t have to quit for my surgery, so I don’t want to quit right now”.

**Stress.** Both general family and personal stress were also provided as reasons for not participating in the intervention. Personal stressors cited against participation in the invention were solely centered around medical concerns. These included “I am in too much pain”, “I have cancer”, and “I am concentrating on not using [drugs]”. Another patient was suffering from an acute illness and used this as a rationale for not wanting to participate in the intervention stating: “I have a stomach ache and I don’t feel well. I don’t want to talk to you about quitting smoking”.

### **Additional Interventions Offered**

Additional evidenced based interventions were offered to assist patients participating in the intervention for smoking cessation. All patients participating in the intervention were offered nicotine replacement (NRT) in the forms of patches, gum, lozenges, and inhalers. Medications approved for smoking cessation including varenicline (Chantix) and bupropion (Wellbutrin, Zyban) were also offered to patients in the intervention groups. Electronic cigarettes, or E-cigs were not given as an option to patients. This is because their overall safety and their effectiveness as smoking cessation aids have not been well studied. Additional interventions including smoking cessation classes offered at the local hospital and quit lines were also offered to the patients in the intervention group. All patients in the intervention group were unaware that

some medications used to treat tobacco dependence can be combined. All patients in the intervention group were unaware that bupropion can assist patients with smoking cessation but all were aware that this medication treats depression. All patients in the intervention group declined using both varenicline and bupropion to assist them with cessation. Two of the three patients declining using varenicline cited a fear of side effects as the main reason why they were unwilling to take this medication. Three free samples of varenicline were available at the office for patients during the implementation period. All three of these samples remain at the DNP site. All patients declined to use a quit line to assist them with quitting smoking and all three questioned its effectiveness. All patients in the intervention group as well as those outside of the DNP project intervention group indicated that they would not attend smoking cessation classes outside of the implementation site. Two patients accepted pharmacologic assistance with their cessation efforts and they both decided to use combination therapies. Both patients decided to use a combination NRT and both selected patches as well as an inhaler. Both patients felt the inhaler would help with cravings since it can be held like a cigarette. Neither patient used these items during the implementation period and therefore, it is unlikely these interventions assisted in reducing cigarette consumption.

### **Patient Discontinuation**

One patient declined further participation at the end of the implementation period. When approached as to why she declined further participation she stated, “I am really not ready to quit smoking and I have a lot going on right now.” She also expressed dissatisfaction with having her insurance billed for smoking cessation visits. Patient 0003 only attended one visit was lost to follow up until after the intervention period. She cited “I am really busy and I work nights, I don’t have a lot of time for appointments during the day. Also, I have been busy because my

father is sick.” Similar themes arose here as well. Both time and stress were cited as barriers for completing the intervention.

### **Patient Satisfaction**

A post-intervention survey was used to evaluate patient satisfaction with the MI for smoking cessation intervention (see Appendix F for a copy of this post intervention survey). Two out of the three patients that participated in the DNP project intervention completed this survey. However, only one was completed during the intervention period.

Both patients rated the intervention favorably on Likert scale items. Both patients felt that the intervention taught them something new, assisted them with smoking cessation, helped them change their behavior, and increased their confidence. Both patients also indicated that they found the MI for smoking cessation intervention enjoyable and that it provided them with tools that they can use to quit or refrain from smoking.

Qualitative items were also included in the post intervention survey. To evaluate what patients did not like about the intervention, participants were asked to identify what they found to be the least helpful part of the program as well as what elements of the program they liked the least. One patient declined to answer both of these questions. The other patient only responded to these items by stating, “Nothing, everything was helpful”. Both patients identified different aspects of the intervention that they found to be most helpful. One stated, “Not being judged. Looking at myself and making my own goals” while the other stated, “Just talking about it”. When asked about that what they liked about the program one responded, “not being pushed” while the other responded, “the insight it gave me about myself because it made me look deeper into my own goals. I was able think about my wants/needs and it helped me with more than just smoking” (see Table 5, Survey Responses to Likert Scale Items).



**Table 5**

*Survey Responses to Likert Scale Items (0-5 Scale with 0=Strongly Disagree and 5 = Strongly Agree)*

Survey Item	Patient 0001	Patient 0003
I feel that I learned something from the smoking cessation intervention	Strongly Agree (5/5 in Likert scale)	Strongly Agree (5/5 in Likert scale)
I feel that this program helped me make progress towards quitting smoking	Strongly Agree (5/5 in Likert scale)	Strongly Agree (5/5 in Likert scale)
I feel that this program helped me change my smoking behavior	Strongly Agree (5/5 in Likert scale)	Agree (4/5 in Likert scale)
After completing this program, I feel more confident about my ability to quit smoking	Strongly Agree (5/5 in Likert scale)	Agree (4/5 in Likert scale)
I enjoyed the sessions for smoking cessation	Strongly Agree (5/5 in Likert scale)	Agree (4/5 in Likert scale)
I will use the tools I learned in this program to quit smoking or refrain from smoking	Strongly Agree (5/5 in Likert scale)	Agree (4/5 in Likert scale)

One of the goals for this DNP project was to have patients complete a post intervention survey with both qualitative and quantitative aspects. An expected outcome was that 100% of the patients participating in the intervention would complete this survey. This goal was not met. One patient declined further participation in the intervention and therefore, was not contacted to complete the post-intervention survey. However 66% of the three person intervention group did complete the survey. Another expected outcome was that 70% of the patients expressed satisfaction with the MI intervention on Likert scale items. This goal was met with both respondents indicating satisfaction with the intervention on 100% of the Likert scale items on the

post-intervention survey. The final expected outcome for demonstrating patient satisfaction with the intervention was that 50% of the patients would describe elements that they enjoyed about the intervention. This expected outcome was also met.

### **Provider Evaluation**

At the end of the intervention period a brief interview was completed with the intervention site provider to evaluate her perspective regarding the DNP project intervention. Overall the implementation site provider felt that the intervention was useful and a good fit for the patients at the DNP project site. She also expressed her satisfaction with the work completed at her practice. She, like the DNP student, wished that more patients would have agreed to participate in the program. She also found the post-intervention educational website to be a valuable tool. She was amenable to the recommendations based on the DNP project intervention. The final goal for this DNP project was to ensure that the intervention was sustainable by providing an educational resource to the implementation site provider. This educational resource was created in the form of a website. The expected outcome was that the DNP project site provider would agree to implement four of the recommended interventions to assist patients with smoking cessation. This goal was met because she agreed to implement all recommended practice changes. However, she was unable to articulate a specific timeline for these events.

### **Analysis and Implications**

Despite the small number of patient participants, much can be learned from implementation of this DNP project and the data collected. This information can be useful not only for the implementation site, but for others considering improving the care of tobacco dependent patients.

**Co-Morbidity/Pain**

All three of the DNP project participants suffer from a condition causing chronic pain. Studies have well demonstrated that smoking and chronic pain are comorbid conditions (Ditre, Brandon, Zale, & Meagher, 2011; Shi, Weingarten, Mantilla, Hooten, & Warner, 2010). In fact, the prevalence of smoking among chronic pain patients is twice that of the general population (Ditre et al., 2011). The high level of comorbidities between chronic pain and tobacco use puts an additional burden on health care systems. Also, chronic pain patients that smoke, typically utilize maladaptive methods to cope with their pain including reduced activity, higher levels of emotional distress, as well as increased dependence on medications. Smoking is also a known risk factor for chronic pain conditions (Ditre et al., 2011; Shi et al., 2010). These conditions include low back pain, rheumatoid arthritis, headaches, oral disease, fibromyalgia, dyspepsia, menstrual pain, Burger's disease, temporomandibular joint pain, and osteoarthritis (Ditre et al., 2011).

None of the participants in the program were able to quit smoking during the intervention period. This could be related to the patient's pain level. Evidence suggests that pain is a particularly strong motivator for smoking (Ditre, Heckman, Butts, & Brandon, 2010). A study by Ditre and Brandon (2008) was the first study to identify that pain motivates patients to smoke. Pain also increases the urge to smoke and reduces the latency period between cigarettes. It is possible that these patients, like many other chronic pain patients, are caught in a vicious cycle. Pain causes patients to smoke more, smoking more exacerbates pain, and the exacerbation of pain reinforces the desire to smoke as well as reduces the time between cigarettes. Therefore, smoking interventions with chronic pain patients may need a greater focus on pain and how it affects smoking behavior.

**Gender and Age**

All patients in the intervention group were female. Some studies have suggested that female smokers struggle more to achieve abstinence from tobacco products (Caponnetto & Polosa, 2008). A more recent study found that overall, across all age groups, there was little difference in cessation between genders (Jarvis, Cohen, Delnevo, & Giovino, 2013). However, when investigating specific age groups, they found that women under the age of fifty were more likely to quit smoking than men, but in older age groups, men were more likely than women to quit. Therefore, the participant's age may have influenced their success. These age and gender differences are important to consider when treating female patients over the age of fifty. Amos, Greaves, Nichter, and Bloch (2011) argues that we need to move away from a gender-blind approach to smoking cessation. Further research is needed to develop and change interventions to serve women better. Based on the results of this DNP project, this DNP student would agree with this assertion.

**Significant Others/Social Network Influences**

Two of the three participants lived with another person who smokes. Living in a household with another smoking person can significantly influence cessation efforts. Not having a person in the home that smokes has been found to be a strong predictor of success with cessation efforts (Caponnetto & Polosa, 2008). Therefore, a patient's living situation and social network are important factors to consider when implementing smoking cessation interventions.

**Reduction of Use**

Two patients in the intervention group did reduce their cigarette consumption during the intervention period indicating that the MI intervention may have assisted these patients to reduce

their cigarette consumption. Other studies have found that MI interventions for smoking cessation produced similar reductions in daily smoking rates (Audrain-McGovern et al., 2011), Colby et al., 2012; Manuel et al., 2013; Norman et al., 2008). Patient 0003 smoked more at baseline and had a greater reduction in her daily cigarette use than the other patient in the intervention group. This result was similar to Harris et al. (2010) who found that those that smoked more frequently had a greater reduction in smoking days at the end of their intervention. Reduction in consumption can also be important since the level of nicotine dependence is related to the probability of being successful at cessation attempts. Smokers with a high level of dependence have been known to suffer with greater withdrawal symptoms and relapse earlier (Caponnetto & Polosa, 2008). Therefore, the reduction of the participant's average use could lead to a lower level of dependence, which may positively impact their future cessation attempts. Reduction in cigarettes smoked daily can reduce harm and indicates progress towards complete cessation.

### **Stages of Change**

All three of the DNP project intervention participants made some progression through the stages of change, both during MI sessions as well as between MI sessions. These results are similar to other studies, which found that a significant percentage of patients progressed through the stages of change during the intervention (Mujika et al., 2014; Patten et al., 2008). This indicates that MI interventions can assist patients to progress towards action oriented stages of change. Also, as participants progressed through the stages of change, in this intervention, they reduced their daily cigarette use. This is similar to the results observed in a study by Battaglia et al. (2013).

### **Additional interventions**

Data from this intervention revealed a generalized lack of awareness of combination medications for smoking cessation. According to Fiore et al. (2008), combination first-line medications have been shown to be effective and therefore providers should consider combination medications for smoking cessation. Currently, the only combination therapy approved by the Federal Drug Administration (FDA) for smoking cessation includes the use of NRT patches with bupropion. However, current guidelines also suggest combining the nicotine patch with the nicotine inhaler, nicotine gum, or the nicotine spray. It is possible that a lack of awareness of combination medications is a barrier to smoking cessation in this patient population. It is also possible that the lack of understanding about varenicline is also a barrier to cessation. Patients in this intervention all declined to use varenicline and two patients declined its use citing concerns about side effects. Varenicline is recommended as a first line smoking cessation medication and is supported by high-level evidence (Fiore et al., 2008). Studies comparing varenicline to bupropion have found that varenicline can be more effective. Results from this intervention indicate that the lack of knowledge regarding smoking cessation products and their side effects is a barrier to their use.

### **Patient Satisfaction**

Both patients that reviewed the intervention indicated that they were satisfied with the intervention, learned something from the intervention, and found it to be more helpful than previous interventions. Patients who reviewed the intervention felt that it was enjoyable and found it to be effective despite not being able to quit during the intervention period. Patients cited a lack of judgment, being able to discover new things about themselves, and being allowed to discuss cessation as helpful aspects of the MI intervention. This indicates this intervention was well received and patient-centered. Patient satisfaction in this intervention was similar to a study

performed by Mujika et al. (2014) where patients in their sample were generally satisfied with the intervention as well as appreciated being able to talk and be listened to by providers utilizing motivational interviewing. The participants in this study also indicated that they enjoyed not being told what to do and not being provided with the usual threatening messages indicating, that these participants in this also enjoyed a lack of judgment. One of the DNP project participants also indicated that they enjoyed not feeling coerced into cessation similar to the participants in the study by Mujika et al. (2014).

### **Barriers and Limitations**

Several barriers were encountered in implementing a MI for smoking cessation intervention at the primary care site. The first, and possibly the most significant barrier was patient recruitment. The staff at the DNP project site showed excellent enthusiasm for the DNP project intervention and were willing to assist the DNP student. However, the implementation site staff was unable to successfully recruit patients when the DNP student was not present. When the recruitment plan changed to meeting with patients after their visits with the implementation site provider, it limited the days available to recruit patients, but did result in greater participation. Also, days at the end of the week were slated for recruitment. This became a barrier because several major holidays and office closures occurred during the end of the week. The office was close during the implementation period three times, limiting recruitment time and patient access.

Also, this intervention was not integrated into routine visits, which could have influenced a patient's decision to participate. Many patients were unwilling to participate because they would have to return to the intervention site on a separate day. Patients that did participate in the intervention preferred to complete them just before/after their primary care or chronic pain visits.

Recruitment may have also been influenced by the need to sign up for the DNP project intervention. Patients in the early stages of change may not want to talk or even think about smoking cessation. When patients have to enroll in a separate program for smoking cessation, it requires a certain personal level of motivation. Many patients contacted in the early stages of change may not have been motivated or in the right frame of mind to join a smoking cessation program, demonstrating a self-selection bias. This was demonstrated in the DNP project intervention data since many patients cited a lack of readiness as a reason for not participating in the intervention. Time, medical concerns, and stress were also common themes identified as reasons for not participating in the intervention.

Data from this DNP project intervention suggest that MI interventions for smoking cessation may be more successful if integrated into primary care visits. Integration would eliminate the need for recruitment because all smoking patients would participate in the intervention. MI is a patient-centered conversation about change. Therefore, MI interventions could happen during primary care visits without the need for soliciting patients to agree to a specific intervention. This would also eliminate self-selection bias because patients would not need to consent or sign up for a specific intervention. This would also address the barrier of readiness. MI is an intervention that can be used at any stage of change and at any level of readiness. If MI was integrated into primary care visits, a lack of readiness would be the starting point for talking with the patient about change. MI can be used to assist the patient to progress along the stages of change increasing their readiness to quit smoking. This exemplifies the hallmark of MI, which is to elicit change and assist patients to resolve their ambivalence about change (Miller & Rollnick, 2013). Also, Codern-Bové (2014) found that MI assists with the development of patient-provider relationships. They also found that for patients with low



motivation for smoking cessation, MI provides an opportunity that may not otherwise be available to address tobacco dependency in an office visit. Integration of MI for smoking cessation visits can also assist with time, a frequently cited barrier to participation in the DNP intervention.

Also, chronic pain patients at the DNP project site are required to follow up with the implementation site provider at least once a month. Therefore, chronic pain patients would have the opportunity to have frequent MI sessions for smoking cessation if they were integrated into these visits. Research has suggested that increased clinical contact can improve cessation outcomes (Lundahl et al., 2010). Since smoking is a known risk factor for several chronic pain conditions and pain is a known barrier to cessation, MI interventions could be developed as well as researched to address smoking cessation with this patient population. This is a tremendous opportunity to improve the quality of care for tobacco dependent patients coping with chronic pain.

Integration of MI into routine patient visits at the DNP project intervention site would allow the common themes of time, stress, and other medical conditions as barriers to cessation to be addressed through the lens of MI. These themes are all common forms of sustain talk identified in MI texts (Miller & Rollnick, 2013; Rosengren, 2009). Therefore, strategies for addressing sustain talk and managing resistance could be utilized. Managing resistance and responding appropriately to sustain talk is essential in MI, because the more patients utilize sustain talk, the more they convince themselves not to change their behavior. Reflections, emphasizing autonomy, reframing, and agreeing with a twist are all ways to manage sustain talk identified in this DNP project.

Another barrier identified was a lack of smoking status assessment. The current clinical practice guideline for smoking cessation recommends that all patients be asked about and have their current smoking status documented at every visit (Fiore et al., 2008). Data obtained in creating this guideline suggests that most patients are interested in cessation and that many providers are in frequent contact with smoking patients, providing them with an opportunity to address smoking cessation. However, research has also shown that many health care providers do not assess smoking status regularly with patients. The Centers for Medicaid and Medicare Services (CMS; 2014) state that ongoing interest in cessation is a crucial first step in helping patients achieve cessation. The intervention site EMR has a place for documentation of smoking status. However, the EMR does not prompt the provider to complete a smoking status assessment during each patient visit. Current guidelines also recommend incorporating a smoking status assessment with the vital signs assessments with each patient at every visit (Fiore et al., 2008). Therefore, the smoking status of each patient could be assessed, recorded, and documented at the time of vital signs assessment. Lack of assessment can lead to lack of intervention, as smoking patients may not be identified. This could have impacted implementation of the intervention because not all smoking patients are being identified at the DNP project site and without identification, smoking cessation interventions can't be offered.

Another barrier or limitation identified during DNP project implementation was a lack of follow up with smoking patients. Follow up is not only necessary for those patients that continue to smoke after MI sessions, but is also important for patients after they have decided to quit. Fiore et al. (2008) recommends that all patients that have decided to stop smoking should have a follow up within the first week after quitting. This follow up provides the opportunity to assess if the patient was successful or not in cessation efforts, has questions or concerns, or needs further

assistance. This follow up also allows for more MI if needed. Current evidence does not state that follow-up will prevent relapse, but research shows that continued contact with providers increases the likelihood that patients will discuss cessation with their provider in later quit attempts. Research has also demonstrated that telephone follow up after clinic-based MI sessions produces better outcomes (Ridner et al., 2014). It is possible that having a follow up system in place could have improved the outcomes for the patients during the intervention and continue to improve the care of tobacco dependent patients at the implementation site.

Billing for smoking cessation was also a barrier. One patient declined further participation because her insurance was billed for smoking cessation interventions. The implementation site provider felt that the DNP project intervention should be as close to independent practice as possible, including billing insurance. The intervention did not cost any patient directly because billed services not covered by insurance were written off by the implementation site owner. However this finding may be significant as it indicates that cost and billing insurance could be a barrier for other patients. Further research is needed about how the cost of smoking cessation counseling affects cessation. Cost can be an important motivator for patients. Cost was identified in the DNP project data as a motivator for cessation. Taxation of cigarettes has been found to have a positive impact on smoking cessation as well (Bader, Boisclair, & Ferrence, 2011). If cost is such a strong motivation for cessation, it is also a likely barrier to cessation.

### **Cost Benefit Analysis**

The total cost of this project was \$263.00, which was ten dollars less than projected. This amount covered the materials, training, and equipment needed to complete the DNP project. The DNP student had complete fiscal responsibility for the DNP project. There was no cost

requirement for the DNP project site provider, other than the use of space at the implementation site (see Table 6, Cost Itemization)

**Table 6**

*Cost Itemization*

Item	Projected Cost	Actual Cost
Physical Materials		
1 ream of multi colored paper	\$9.00	\$13.00
1 package of ballpoint pens	\$9.00	\$0.00
2 reams of regular copy paper for handouts, surveys, and record keeping	\$10.00	\$5.00
1 toner cartridge for printing	\$30.00	\$30.00
Personnel		
DNP student training in motivational interviewing	\$215.00	\$215.00
Project Space for Program Implementation		
Meeting space for motivational interviewing sessions	\$0.00	\$0.00
<b>Total Estimated Costs/Expenses</b>		
<b>Total Final Cost</b>	<b>\$273.00</b>	<b>\$263.00</b>

The overall cost of the intervention was low and the potential savings are quite high. The total economic cost of smoking is \$300 billion yearly, with \$170 billion dollars in direct medical costs (CDC, 2015; Xu, Bishop, Kennedy Simpson, & Pechacek, 2014). The total cost to the Vermont economy annually attributed to smoking is \$652,878,180,768, more than two million of which is direct health care expenditures (American Lung Association, 2015). Each pack of cigarettes sold costs the state economy \$24.52. This project helped two patients reduce their cigarette consumption drastically, which could benefit both the economy as well as provide savings for the patients. The average cost of a pack of cigarettes in the state of Vermont is \$6.54. Reduction in daily smoking by half could result in a savings of more than fifteen thousand

dollars over a ten-year period (American Lung Association, 2015; U.S. Department of Health and Human Services, n.d.). Also, according to the American Lung Association (2015), for every 1 dollar Vermont spends on tobacco cessation efforts there is a potential return on investment of \$1.32. It is possible that the return on investment for this project could be as high as \$347.16.

This intervention was costly in terms of time, which outside of the academic setting, could have significantly influenced the cost of this intervention. More than 3 hours were devoted to completing MI sessions with patients during the intervention. Additionally more than 90 hours was spent recruiting patients. The mean hourly wage for a Nurse Practitioner in the United States is \$47.11 (United States Department of Labor, 2015). Therefore, even though the DNP student was not compensated for her time, the potential cost per hour for this intervention would be \$4,381.23, which is expensive. If the DNP student were compensated for her time, this primary care intervention would have cost \$4644.23. This is especially important to consider because recruitment was low and the intervention was time intensive.

### **Sustainment of Intervention and Dissemination of Findings**

Sustainment is an essential aspect to quality improvement interventions. To sustain the intervention a website was created for providers, patients, and the implementation site provider. Providers can access this website for general information about MI and MI skills. They can also access video examples of motivational interviewing for practice and reference. Patients considering cessation can access this website for resources that they may find valuable in their cessation efforts. The DNP project site provider can also access the website for information regarding MI and MI skills. She can also access this site for specific practice-based recommendations based on data collected and analyzed, MI recommendations, as well as barriers observed in the while completing this DNP project. To sustain this intervention,

recommendations provided to the implementation site provider include training in MI, integration of MI into routine patient visits, ways to improve tobacco use assessment to ensure compliance with current smoking cessation guidelines, methods for addressing common themes identified as barriers for patient participation, and specific recommendations for follow up. The DNP project site provider has committed to continuing this intervention by following the recommendations set forth on the website. This website was also created to promote the use of MI by other providers by giving them a resource that they can access at any time on any device.

Findings generated by completing this DNP project will be disseminated at the University of Massachusetts Amherst Nursing Scholarly Presentation Day where a power-point presentation and unveiling of the post-intervention website will be used to describe the results of this DNP project. Results will also be published in University of Massachusetts Amherst Scholar Works. Abstracts are also being prepared for submission to motivational interviewing organizations, provider organizations, and nurse practitioner organizations.

This DNP student has developed a large skill base and understanding of implementing MI interventions with patients. This project has sparked a passion and a drive to continue to utilize MI interventions to assist patients with behavior change. Also, this DNP project can be thought of as a pilot study. According to Thabane et al. (2010), pilot studies assist in illuminating issues with processes, resources, management, and science. This DNP student plans on taking the information gathered in this project to improve research and practice for tobacco dependent patients in primary care utilizing MI. Additionally, the DNP project site provider has agreed to allow the DNP student to continue to utilize MI for smoking cessation at her practice site. Since the end of the intervention, the DNP student has assisted three patients to make a quit attempt.

### **Conclusion**

In conclusion, smoking and tobacco dependence continues to be a relevant problem that needs to be addressed in primary care. MI is one evidenced based intervention that can be utilized to assist patients to achieve smoking cessation. While recruitment was challenging and participation was low, data suggests that this intervention was effective at reducing participant's cigarette consumption as well as assisting patient progression through the stages of change. Data also indicated that MI interventions were well received by patient participants. Valuable data about barriers to cessation was also collected. This data can provide a greater understanding as to why smoking cessation is challenging and ways to address these challenges were discussed. This intervention will be sustained through provider utilization of the post-intervention website and by the intervention site provider's willingness to make changes in her practice based on recommendations developed during DNP project implementation. Results of this DNP project will be shared with fellow DNP students as well as professional peers to contribute to the knowledge base regarding motivational interviewing and treatment of tobacco dependence in primary care.

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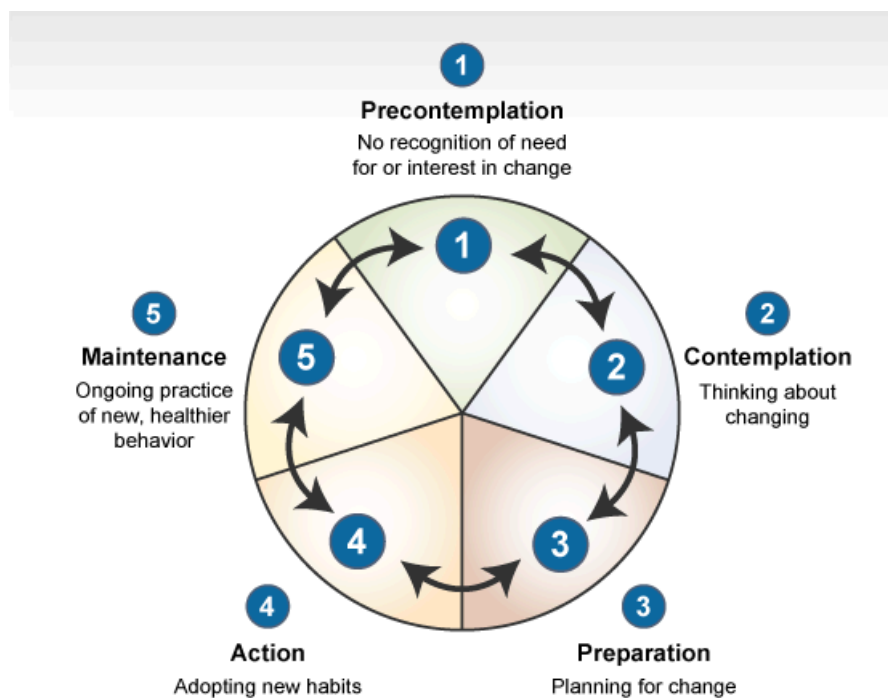
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## Appendix A

## The Stages of Change in the Transtheoretical Model (TTM)



(University of Rhode Island, 2015; Prochaska & Di Clemente, 1982)

## Appendix B

## Evidence of Training



# Health Education & Training Institute

## Certificate of Attendance and Participation

**Kara Pool**

**Motivational Interviewing: The Basics**

**John Brelsford, PhD**

**August 26 & 27, 2015 - Springfield, Massachusetts**

11 Continuing Education Contact Hours

This program is approved by:

National Association of Social Workers • Approval #886615613-1420

Maine Board of Alcohol & Drug Counselors: Program #1828

Stephen R. Andrew LCSW, LADC, CCS, CGP

Sponsored by:  
Health Education & Training Institute  
25 Middle Street  
Portland, Maine 04101  
[www.hetimaine.org](http://www.hetimaine.org)

We are grateful for your wonderful presence, your courage, your commitment, and your sense of fun.



# Health Education & Training Institute

## Certificate of Attendance and Participation

**Kara Pool**

### Motivational Interviewing: Advancing the Practice

John Brelsford, PhD

August 28, 2015 - Springfield, Massachusetts

5.5 Continuing Education Contact Hours

This program is approved by:  
National Association of Social Workers • Approval #886615613  
Maine Board of Alcohol & Drug Counselors: Program #2086

Stephen R. Andrew LCSW, LADC, CCS, CGP

Sponsored by:  
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We are grateful for your wonderful presence, your courage, your commitment, and your sense of fun.

## Appendix C

## Stage of Change Assessment Tool

The following questions will be used to identify a patient's current stage of change:

1. Are you currently smoking?
2. Are you seriously considering quitting smoking in the next 6 months?
3. Are you planning to quit in the next 30 days?
4. Have you quit smoking for a period of at least 24 hours in the past year?
5. How long have you been off cigarettes?
6. On average, how many cigarettes do you smoke in one day (24 hours)? (Prochaska & DiClemente, 1992, p. 188)

## Appendix D

## Human Subjects Determination Memorandum



University of Massachusetts Amherst  
108 Research Administration Building  
70 Butterfield Terrace  
Amherst, MA 01003-9242

**Human Research Protection Office  
Research Affairs**

**Telephone:** 545-3428  
**FAX:** 577-1728

## MEMORANDUM

To: Kara Pool-Krok-Horton  
From: Human Research Protection Office  
Date: September 28, 2015

**Project Title: Motivational Interviewing for Smoking Cessation**

**IRB Number: 15-014**

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination:

- ☐ The activity does not involve research that obtains information about living individuals.
- ☐ The activity does not involve intervention or interaction with individuals OR does not use identifiable private information.
- ☒ The activity is not considered research under the human subject regulations. (Research is defined as "a systematic investigation designed to develop or contribute to generalizable knowledge.")
- ☐ The activity is determined to meet the definition of human subject research under federal regulations, but may qualify for exemption. If uncertain as to whether the scope of the research falls within an exempt category, please contact the HRPO for guidance. Exempt determinations must be made by the IRB.
- ☐ The activity is determined to meet the definition of human subject research under federal regulations and is not exempt. The research must be reviewed and approved by the IRB and requires submission of applicable materials.

Information regarding **Types of Review** for human subject research protocols may be found at <http://www.umass.edu/research/irb-guidelines-levels-review>

For additional information, please contact the Human Research Protection Office at 545-3428.

Cc: OGCA

## Appendix E

## Informed Consent Form

Informed Consent Form for Participation  
Consent Form for Participation in Doctor of Nursing Capstone Project  
University of Massachusetts Amherst

**Student:** *Kara Pool-Krok-Horton, BSN, RN, DNP Candidate*  
**Capstone Chair:** *Raeann LeBlanc, DNP, GNP-BC, ANP-BC*  
**Project Title:** **Motivational Interviewing for Smoking Cessation**

**1. WHAT IS THIS FORM?**

This form is called a Consent Form. It will give you information about the Motivational Interviewing for Smoking Cessation Capstone Project.

**2. WHO IS ELIGIBLE TO PARTICIPATE?**

All actively smoking patients over the age of 18 are invited to participate.

**3. WHAT IS THE PURPOSE OF THIS DOCTOR OF NURSING CAPSTONE PROJECT?**

The purpose of this Doctor of Nursing Practice Capstone project is to use motivational interviewing to assist patients in smoking cessation. Motivational Interviewing is a patient-centered counseling method that can assist patients to change behaviors such as smoking.

**4. WHERE WILL THE PROJECT TAKE PLACE AND HOW LONG WILL IT LAST?**

This project will be completed at Hope Medical Center. The project will begin in October 1st, 2015 and will be completed in February 1st, 2016.

**5. WHAT WILL I BE ASKED TO DO?**

If you agree to take part in this study, you will be asked to meet bi-weekly (or an interval of your choice) with Kara Pool-Krok-Horton, BSN, RN, Doctor of Nursing Practice Capstone student. During these sessions we will talk about smoking and your motivation for quitting. During each session you will be asked to complete a 6 question short answer survey about your smoking habits. You will also be asked to complete an 11 item evaluation survey at the end of the project. This survey contains 11 questions: 7 rating scale items and 4 short answer items. You may skip any question you feel uncomfortable answering on any survey during the course of the project.

**6. WHAT ARE MY BENEFITS OF PARTICIPATION?**



Motivational Interviewing is a research-supported method to assist patients to change their behavior. Research has shown that it can be effective for assisting patients to quit smoking. Quitting smoking is not required for participation in this program.

**7. WHAT ARE MY RISKS OF BEING IN THIS STUDY?**

We believe there are no known risks associated with this research study; however, a possible inconvenience may be the time it takes to complete the project

**8. HOW WILL MY PERSONAL INFORMATION BE PROTECTED?**

The following procedures will be used to protect the confidentiality of your project records including surveys and questionnaires. The Capstone Student will keep all study records, including any codes to your data, in a locked filing cabinet that can only be accessed by those working on the project. All surveys and questionnaires will be labeled with a code. A master key that links names and codes will be maintained in a separate and secure location. The master key will be destroyed after the project is completed. At the conclusion of this project, Kara Pool-Krok-Horton, the Doctor of Nursing Capstone Student, may publish the results of this project. Information will be presented in summary format and you will not be identified in any publications or presentations.

**9. WHAT IF I HAVE QUESTIONS?**

Take as long as you like before you make a decision. We will be happy to answer any question you have about this project. If you have further questions about this project or if you have a project-related problem, you may contact the Doctor of Nursing Practice Capstone Student, Kara Pool-Krok-Horton at 802-730-6339. If you have any questions concerning your rights as a participant in this project, you may contact the University of Massachusetts Amherst Human Research Protection Office (HRPO) at (413) 545-3428 or [humansubjects@ora.umass.edu](mailto:humansubjects@ora.umass.edu).

**10. CAN I STOP BEING IN THE STUDY?**

You do not have to participate in this project if you do not want to. If you agree to participate, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate.

**11. WHAT IF I AM INJURED?**

The University of Massachusetts does not have a program for compensating subjects for injury or complications related to human subjects research, but the project personnel will assist you in getting treatment.

**13. SUBJECT STATEMENT OF VOLUNTARY CONSENT**

When signing this form I am agreeing to voluntarily enter this study. I have had a chance to read this consent form, and it was explained to me in a language that I use and understand. I have had the opportunity to ask questions and have received satisfactory answers. I understand that I can withdraw at any time. A copy of this signed Informed Consent Form has been given to me.

---

Participant Signature:

---

Print Name:

---

Date:

By signing below I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

\_\_\_\_\_  
Signature of Person  
Obtaining Consent

\_\_\_\_\_  
Print Name:

\_\_\_\_\_  
Date:

## Appendix F

## Post-Intervention Patient Survey

1. I feel that I learned something from the smoking cessation intervention: strongly disagree, disagree, neither agree or disagree, agree, strongly agree
2. I feel that this program helped me make progress towards quitting smoking: strongly disagree, disagree, neither agree or disagree, agree, strongly agree
3. I feel that this program helped me change my smoking behavior: strongly disagree, disagree, neither agree or disagree, agree, strongly agree
4. After completing this program, I feel more confident about my ability to quit smoking: strongly disagree, disagree, neither agree or disagree, agree, strongly agree
5. I enjoyed the sessions for smoking cessation: strongly disagree, disagree, neither agree or disagree, agree, strongly agree
6. I will use the tools I learned in this program to quit smoking or refrain from smoking: strongly disagree, disagree, neither agree or disagree, agree, strongly agree
7. This program was more helpful than previous programs I have participated in to quit smoking: strongly disagree, disagree, neither agree or disagree, agree, strongly agree
8. What did you find the most helpful about this program?
9. What did you like the about this program? Why?
10. What did you find to be the least helpful part of this program?
11. What did you like the least about this program? Why?