ASSESSING HOW TO INCREASE SMOKERS' MOTIVATION TO QUIT

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ABSTRACT

This three-part dissertation study aims to explore how to increase motivation to quit in current smokers with low motivation. Recognizing what motivates smokers to quit and how to increase motivation are key elements to tailoring successful smoking cessation strategies, especially for those with low motivation to quit. Chapter One reviews the literature on motivation and smoking in the US, and how these two are related. Chapter Two tested the Health Action Process Approach using data from a cross-sectional survey of current smokers and multiple measures of motivation to quit and risk perceptions. Results supported the model, indicating that non-intenders had lower risk perceptions compared to intenders. Chapter Three examined the differences in perceptions of how those with high, medium, and low motivation to quit smoking perceive smoke-free laws and the extent to which a physician was involved in motivating them to quit. Using cross-sectional data of current smokers, chi-square tests and ordinal logistic regression compared smokers by their level of motivation to quit. Some areas of smoke-free law perceptions and physician involvement differed across levels of motivation to quit smoking. Chapter Four identified factors that influence cessation, investigated quit attempts, and explored methods for staying quit using focus groups with adult ex-smokers. Several key themes relating to motivation to quit smoking were identified that may have implications for the design of smoking cessation programs for adults. Chapter Five will summarize the main findings and discuss implications of results. To decrease morbidity and mortality associated with tobacco use, researchers need to identify factors that lead to increased motivation to quit and develop interventions based on these findings to be able to assist smokers in quitting. The concept of motivation is

important because smoking cessation interventions will not be successful for smokers that are unmotivated to quit.

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PREFACE

History recounts that tobacco use was widespread throughout the American and Caribbean regions for as long as 7,000 years before Christopher Columbus first landed and explored these areas. There is little evidence, however, that tobacco was used outside of the America's until Columbus. As Columbus moved east back to Europe, the spread of tobacco became rampant over the next century. What had started out as a pleasure soon turned to a necessity as more and more people became addicted, thus assuring a "business" of tobacco (Burns, 2007).

Now, more than 500 years later, smoking tobacco is one of the leading causes of preventable death in the United States (United States Department of Health and Human Services [USDHHS], 2000). It has been linked to an increased risk of various forms of cancer, chronic obstructive pulmonary disease, and heart disease (American Cancer Society [ACS], 2009). Tobacco products kill about 3 million people per year, and it is estimated that if the current tobacco use trend continues this number will reach 10 million by 2020 (World Health Organization [WHO], 1997).

However, it was not until studies from the 1930's, 1940's and 1950's that the strong association between tobacco use and disease and death in humans became widely known (Glynn, Seffrin, Brawley, Grey, & Ross, 2010). Studies by Richard Doll in the late 1940's and early1950's (for example, Doll & Hill, 1950; Doll & Hill, 1952) supported the epidemiological link between smoking and lung cancer. In the early 1960's, two milestone reports emerged that confirmed the causal link between tobacco use and disease (Fiore & Baker, 2009; United States Public Health Service, 1964). As a result of these reports and other research, large public health efforts began in the 1960's and has helped reduce the prevalence of tobacco use by 50% or more in the majority of Westernized countries (USDHHS, 1986).

Despite this progress, it is estimated that 46 million Americans still smoke cigarettes (Centers for Disease Control and Prevention [CDC], 2009). Arguably, most smokers do want to quit smoking, but lack the tools and motivation to do so. To be able to assist smokers in quitting and decrease the morbidity and mortality associated with tobacco use, researchers need to continue to identify factors that lead to increased

motivation to quit and develop interventions based on these findings. The concept of motivation is important because smoking cessation interventions will not be successful for smokers that are unmotivated to quit.

CHAPTER 1. INTRODUCTION

Background and Significance

Smoking Prevalence

Smoking is one of the leading causes of preventable death from cardiovascular disease and cancer (USDHHS, 2000). Smokers who quit can reduce their risks of these health issues and greatly increase their life expectancy (USDHHS, 1990). It is estimated that in the United States 46 million people or about 21% of all adults (aged 18 years and older) currently smoke cigarettes (CDC, 2009). The good news is that just as many adults are former smokers (21.5%) and more than 50% of adults have never smoked (CDC, 2008b) (see Table 1.1).

Table 1.1. Percent Distribution of Smoking Status Among US Adults by Gender, January-June, 2008*

Smoking Status	Percent (%)	95% Confidence Interval
Never Smoked		
Total	57.6	56.3-58.9
Male	51.6	49.8-53.4
Female	63.6	61.6-64.9
Former Smoker		
Total	21.5	20.6-22.5
Male	24.9	23.5-26.3
Female	18.4	17.3-19.6
Current Smoker		
Total	20.8	19.8-21.9
Male	23.5	22.1-25.0
Female	18.3	17.0-19.7

*CDC, 2008b

The State of Hawai‘i is not immune from these statistics. About 15% of adults in Hawai‘i report smoking cigarettes every day (Pobutsky & Lowery St. John, 2010). Males, those within the ages of 18-24, residents living on neighbor islands, Native Hawaiians descent have the largest prevalence of smoking in Hawai‘i (CDC, 2008a; Pobutsky & Lowery St. John, 2010). Unfortunately, 70% of smokers in Hawai‘i are not motivated to

quit within the next month (Pobutsky & Lowery St. John, 2010). Table 1.2 presents the prevalence of smoking in Hawai‘i (CDC, 2008a)

Table 1.2. Prevalence of Smoking in Hawai‘i, 2008*

	Smokes Every Day (%)	Smokes Some Days (%)
Age Group		
18-24 Years	15.6	3.0
25-34 Years	15.1	5.7
35-44 Years	10.9	5.1
45-54 Years	14.9	3.4
55-64 Years	10.3	3.1
65+ Years	5.1	1.3
Gender		
Male	13.6	4.6
Female	10.0	2.8
Ethnicity		
White	10.3	4.0
Native Hawai‘i an	15.3	5.9
Filipino	14.6	3.2
Japanese	10.3	2.2
Other	11.4	3.6
Education Level		
Some High School	22.5	3.1
Graduated High School	17.1	4.6
Some College	11.6	4.2
College Graduate	6.3	2.6
Marital Status		
Married	9.1	2.9
Unmarried	15.7	4.7

*CDC, 2008a

Second-hand smoke (SHS) is also a major health concern for both the United States and Hawai‘i. According to a report by the US Surgeon General, no amount of SHS exposure is deemed safe (USDHHS, 2006). SHS has been linked to heart disease and lung cancer in non-smoking adults and sudden infant death syndrome, acute respiratory infections, middle ear disease, and asthma in children (USDHHS, 2006). As a result of the 26 million non-smoking adults and 22 million children in America that are being

exposed to SHS (USDHHS, 2006), an increasing number of states and local governments have enacted public smoke-free laws. A Healthy People 2020 objective calls for all 50 states, the District of Columbia, Territories, and Tribes to establish laws that make indoor public places and worksites completely smoke-free (USDHHS, 2010).

Background on Motivation to Quit Smoking

It is a common assumption that smokers are motivated (i.e., have the desire and determination to change) to quit out of concern for their health (Dillard, McCaul, & Klein, 2006; McCaul et al., 2006). Literature has identified the main motivators to quit smoking as health, social concerns, and financial considerations, with health being the top motivator (McCaul et al., 2006). Because it is almost universally known that smoking is very unhealthy, it is not surprising that about 70% of smokers want to quit (Hymowitz et al., 1997). Unfortunately, even if a smoker *wants* to quit, more than 30 million American smokers are not *thinking* about changing their smoking habits in the near future (McCaul et al., 2006). Further, most of the 46 million smokers in the United States do not try to quit smoking during any year, even for a day (Schoenborn, Adams, Barnes, Vickerie, & Schiller, 2004). Of those who do try to quit, a majority fail on any given attempt (McCaul et al., 2006).

In a review of studies assessing what motivates smokers to quit, McCaul et al. (2006) concluded that health concerns are the most significant motivating factors in someone deciding to quit. It should be noted, however, that health concerns is a better predictor of interest in quitting and quit attempts, rather than of successful quitting (Eiser, van der Pligt, Raw, & Sutton, 1985). Rothman (2000) hypothesizes that the decision to engage in a behavior is a function of weighing the costs (such as fear, withdrawal symptoms, weight gain) and benefits (such as increased health, social acceptance) associated with the behavior (i.e., smoking), while maintenance is a function of the satisfaction that comes as a result of the cessation of the negative behavior. Therefore, health concerns about smoking may be a motivating factor for quit attempts, but smokers may notice less immediate health benefits in the short term (such as decreased cancer risk).

Nevertheless, research has shown that increased motivation to quit is associated with heightening the expectancy that smoking will cause health problems (Copeland & Brandon, 2000). According to Weinstein (1998) most smokers do acknowledge that a risk exists from smoking, although they tend to underestimate this risk. Further research has indicated that health concerns may cause smokers to worry, leading to uncontrollable thoughts about risk and negative effects from smoking (Borkovec, Robinson, Pruzinsky, & Dupree, 1983). Dijkstra and Brosschot (2003) found that smokers who worried more about their health were more likely to quit eight months later. McCaul and Mullens (2003) agree that worry motivates self-protecting behaviors. These research findings are supported by Leventhal's model of health threats that suggests a threat (such as the negative health effects from smoking) provokes an attempt to control the danger represented by the threat and an attempt to control the negative emotions caused by the threat (Leventhal, Leventhal, & Cameron, 2001).

External Motivational Factors: External, or extrinsic, motivators are actions in response to rewards or punishments that are from a source outside of the individual, such as friends, family or social pressures (Deci & Ryan, 1985). External motivational factors investigated in Chapter Three include the perceptions of smoke-free laws and the extent of physician advice to quit smoking. Chapter Four qualitatively explored if any additional external factors motivated ex-smokers to quit.

Research has indicated that smoke-free policies reduce tobacco use when implemented in communities (Hopkins et al., 2010). In a review of the impact of smoke-free policies on tobacco reduction, it was found that out of 37 studies included in the final analysis, 21 studies measured absolute differences in tobacco-use prevalence with a median effect of -3.4 percentage points (interquartile interval: -6.3 to -1.4 percentage points); 11 studies measured differences in smoking cessation among smokers exposed to a smoke-free policy compared with smokers not exposed to a smoke-free policy; and found the median absolute change was an increase in cessation of 6.4 percentage points (interquartile interval: 1.3 to 7.9 percentage points) (Hopkins et al., 2010).

A gap exists, however, in identifying the extent to which smoke-free laws increase motivation in those unmotivated to quit smoking. Two studies revealed that

smoke-free laws were a motivator among recent quitters (Frieden et al., 2005; Hammond, McDonald, Fong, Brown, & Cameron, 2004), although it is unknown if these smokers were already motivated to quit or not. Another study examined the impact that smoke-free laws had on motivation to quit among prisoners in the pre-contemplation and contemplation stages of change (see Figure 1.3 for description of the Stages of Change model) (Cropsey & Kristeller, 2003). Pre-contemplators displayed lower motivation to quit smoking than contemplators prior to and during implementation of the smoking ban, and significant differences were found between the two groups on level of agreement with the smoking ban policy (Cropsey & Kristeller, 2003). Further, after implementation of the smoking ban, contemplators continued to report more support for the ban than pre-contemplators (Cropsey & Kristeller, 2003). Additional research is needed to examine how smoke-free laws impact unmotivated smokers to quit in the general population where only certain public places are smoke-free (such as restaurants and bars, but not the home).

In addition to smoke-free laws, physician advice to quit smoking is shown to be effective in increasing quitting among smokers (Fiore, 2000; Kottke, Battista, DeFriese, & Brekke, 1988; Lancaster, Stead, Silagy, & Sowden, 2000). Primary care physicians have a unique opportunity to direct smokers toward the decision to stop smoking and assist them with successful interventions (Block, Hutton, & Johnson, 2000). A meta-analysis of 31 studies comprised of 26,000 smokers revealed that even brief advice from a physician about quitting smoking will increase the quit-rate among smokers (Kottke et al., 1988; Lancaster et al., 2000). Eckert and Junker (2001) supported this finding that a patient's desire to quit smoking correlates with physician advice to quit. Results from their study revealed that 34% of patients who received advice said they felt a strong desire to quit smoking, compared to only 18% of those who could not recall receiving advice from their physician (Eckert & Junker, 2001). Studies show that patients want and expect their providers to ask them about their smoking habits and provide them with necessary interventions when they are ready to quit (Kviz, Clark, Hope, & Davis, 1997). Some success has been shown to enhance short-term movement through the stages of change for smoking cessation as a result of physician involvement (Goldberg et al.,

1994). Unfortunately, research has indicated that advice is typically provided mostly to those who are motivated to quit (Eckert & Junker, 2001).

A limitation of these studies is the lack of distinction between smokers at different levels of motivation to quit. If a patient is unmotivated to quit, most provider attempts at an intervention will fail (Prochaska & DiClemente, 1983). Smokers who are not motivated to quit may not take the same interest in their physician's advice as a motivated smoker. A study by Carpenter, Hughes, Solomon, and Callas (2004) was one of the first to show that using the United States Public Health Service smoking cessation guidelines for unmotivated smokers (Fiore, 2000) leads to increased quit attempts and cessation. These recommendations include the 5 R's: relevance, risk, rewards, roadblocks and repetition. It is not conclusive from this research that physician advice to quit smoking is effective on people with varying levels of motivation to quit. Motivating smokers who have low motivation to quit appears to be more complicated and calls for special counseling techniques (Cornuz et al., 1997). More research and training is needed to allow physicians to build their aptitude to identify and successfully communicate with smokers who are unmotivated to quit.

Internal Motivational Factors: Internal, or intrinsic, motivation factors are driven by the desire to achieve rewards that are internal to the person, such as health (Deci & Ryan, 1985). Chapter Two addressed internal motivational factors, including perceptions of health and risk of getting a disease as a result of smoking and other personal reasons for quitting in. Chapter Four qualitatively explored any additional internal factors that motivated ex-smokers to quit.

The three top reasons cited for quitting when ex-smokers were asked to identify one reason were health concerns (47%), social concerns (14%), and cost (14%) (McCaul et al., 2006). A similar pattern was seen in studies in which ex-smokers were able to name more than one reason for quitting; 75% of ex-smokers chose health as the most frequent reason, followed by an average of 39% of participants listing social concerns (McCaul et al., 2006). In a review of cross-sectional studies that explored reasons current smokers want to quit, the main motivational factor was health reasons (McCaul et al., 2006). "Health reasons" is a broad term that included many concepts, such as experience

of main symptoms, a desire to feel better overall, concern about one's present and future health, experience with illness or death in the family as a result of smoking, and perceptions of risk factors of smoking on one's own health (McCaul et al., 2006). Because these health concerns are related to the internal and external motivational factors described, interventions should focus on health to increase motivation. Cost was the third most frequent answer, with an average of 32% of ex-smokers identifying this as their reason for quitting (McCaul, et al., 2006).

Other studies reported that the majority of smokers chose the top reason for quitting was to have more control over their lives (Orleans et al., 1989), or were more likely to cite a combination of reasons rather than a single reason (Gilpin, Pierce, Goodman, Burns, & Shopland, 1992). McCaul et al. (2006) concluded that "allowing ex-smokers to give multiple reasons is a better measurement method, although it does not make a difference in terms of the *most* important explanation smokers give for quitting" (p. 44).

Need for Additional Research and Purpose of Dissertation

Recognizing factors that motivate smokers to quit is a key element to tailoring smoking cessation strategies to an individual. Furmanski (2003) explained the notion of increasing a smoker's motivation to quit as a "tremendous and virtually untapped opportunity" (abstract). The challenge lies, however, in identifying *how* to actually increase the motivation of smokers so that they can take the next step of changing their smoking behaviors. Although many studies have reported on the effects of interventions for smokers who are ready to quit, few evidence-based smoking cessation interventions to reach those with low motivation to quit exists (Prochaska et al., 2008). To target smokers at earlier stages of readiness, tailored interventions are needed. Research into this area is essential because some data show that motivation to quit predicts actual quitting (Marlatt, Curry, & Gordon, 1988).

More research into how to motivate smokers to quit is necessary. How are risk perceptions from smoking different among levels of motivation to quit? Are those more motivated to quit more accepting of the health risks from smoking? Are there differences in perceptions of physician advice to quit and smoke-free laws among those with high,

medium and low motivation to quit smoking? Is there a relationship between these two motivators? What prompted ex-smokers to make the decision to take action to quit smoking?

Community: Smokers in Hawai‘i

A community is defined as “a unified body of individuals with common interests living in a particular area linked by a common history or common social, economic, and political interests” (Merriam-Webster Online Dictionary, 2010). The community under study in this dissertation is “smokers in Hawai‘i.” The State of Hawai‘i is made up of isolated islands situated in the middle of the Pacific Ocean, about halfway between North America and Asia. This geographic location provides a unique population and history with a mix of Polynesian, Asian, and Western cultures.

Hawai‘i provides a distinctive population of smokers compared to the mainland United States. For example, Hawai‘i has a lower percentage of adults who smoke, a lower amount of males and females that smoke, and less Caucasians who smoke (CDC, 2008a). However, Hawai‘i has more Asians and Pacific Islanders who smoke (CDC, 2008a). Approximately the same percentage of people in the United Stated (US) and Hawai‘i attempt to quit smoking each year (CDC, 2008a). Hawai‘i is unique in that the State Medicaid Program offers a high rate of coverage of tobacco dependence treatments (CDC, 2008a).

It should be noted that Chapter Two utilizes data from smokers in the state of Florida. However, it is hoped that findings from this study can be translated to smokers in Hawai‘i.

Dissertation Framework

Cross-sectional studies with smokers have yielded support for the hypothesis that risk factor perceptions vary across levels of motivation to quit (low, medium, and high), as outlined in the Health Action Process Approach (Schwarzer, 2008) (see Figure 1.2). However, the causal direction of the association between risk perception and motivation remains unknown. Therefore, Chapter Two seeked to expand this issue by testing the hypothesis that smokers with low levels of motivation to quit will have lower risk perceptions than those who are medium or high in motivation to quit; yet there are no

significant differences in risk perception between those who have medium and high levels of motivation to quit. Results from this chapter will assist in determining if unmotivated smokers have lower risk perceptions than those who are motivated to quit. Findings will be useful in developing interventions to increase motivation to quit. Data from this analysis were collected in a Florida study to explore cigarette smoking and smoking cessation (Herzog & Blagg, 2007). Although this data was not collected from Hawai‘i, it is hoped that the findings can be applied to Hawai‘i’s communities.

Chapter Three used data from the 2006 Hawai‘i Adult Tobacco Survey to explore the extent to which the Hawai‘i smoke-free laws (Hawai‘i Department of Health, 2006) are perceived differently across different motivation levels of quitting smoking and the extent to which those at varying levels of motivation received physician advice to quit smoking. Although research recognize both smoke-free laws and physician advice to quit smoking as motivators of cessation (Hopkins et al., 2010; Lancaster et al., 2000), few studies have investigated how these two motivators are viewed by those unmotivated to quit smoking. Therefore, Chapter Three investigated the differences in perceptions between those with high and those with low motivation to quit smoking perceive these motivators. Because both types of motivators are deemed important for increasing cessation rates, Chapter Three examined the correlation between these motivators to determine if both should be implemented together as part of an intervention for increasing motivation to quit.

In order to further examine factors that motivate smokers to quit, Chapter Four reports on a qualitative study that utilized focus groups with ex-smokers. In a review by McCaul et al. (2006) of studies that asked ex-smokers about motivators, a number of consistencies were found across studies, despite diversity in samples and methodology. However, because none of the retrospective studies included in the review entailed a focus group study design, the results from Chapter Four brings additional insight and understanding into what motivates ex-smokers to quit.

See Figure 1.1 for causal model of the dissertation framework.

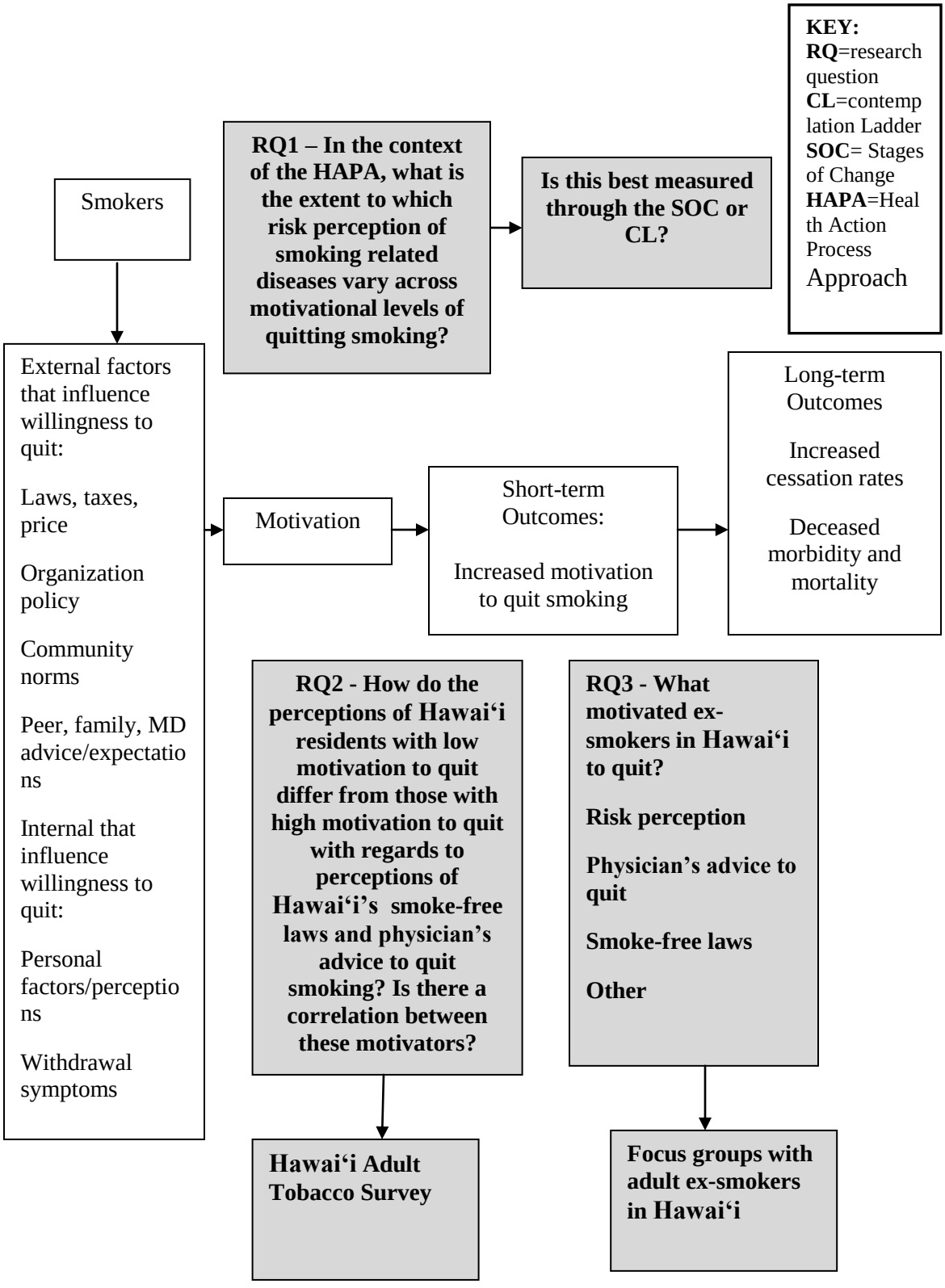

Figure 1.1. Dissertation Framework Causal Model

Conceptual Model: Health Action Process Approach

The Health Action Process Approach (HAPA) defines several predictors of behavior change and specifies a relationship between level of motivation to quit and degree of risk perceptions (Schwarzer, 2008) (see Figure 1.2). The HAPA proposes that there is a distinction between the pre-intentional motivation process (including risk perceptions) that leads to intention to make a behavior change and the post-intentional volition process that leads to the actual behavior change (Schwarzer, 2008). The volition process can be further sub-divided into a planning phase, action phase, and a maintenance phase (Schwarzer, 2008). In the example of smoking cessation, the HAPA predicts that increased risk perceptions would foster a decision to quit smoking, though other mediating variables also would be involved. The HAPA predicts that those who do not intend to quit (non-intenders) should have lower risk perceptions than those who do intend to quit (intenders).

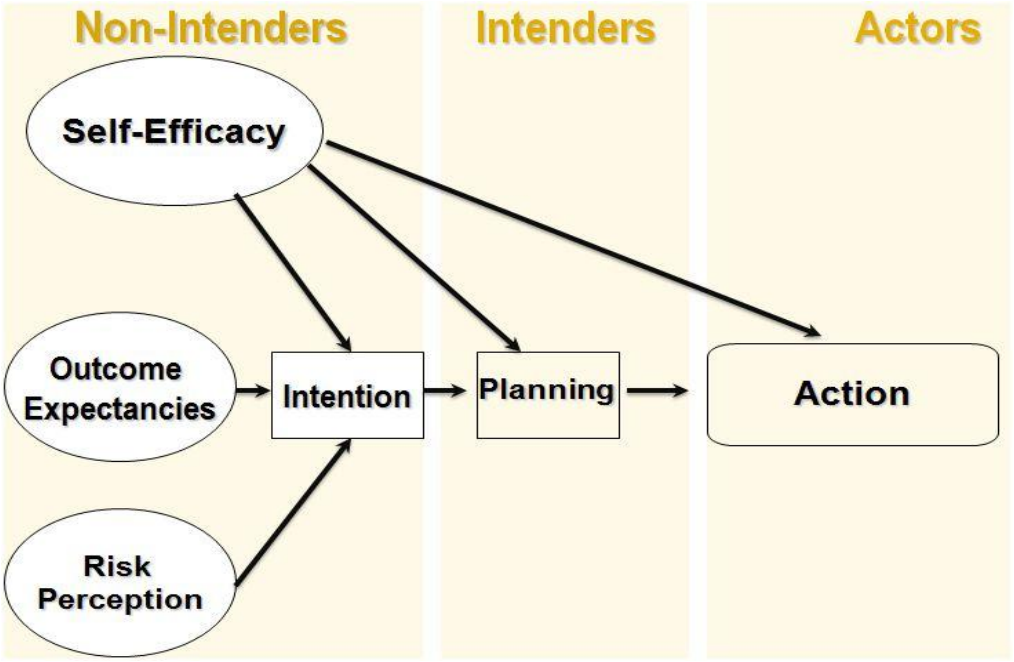

Figure 1.2. Health Action Process Approach Model

Conceptual Model: Stages of Change as a Measure of Motivation to Quit Smoking

Stages of change, such as described in the Transtheoretical Model (TTM), explain how people intentionally change their addictive and problem behaviors (Prochaska, DiClemente, & Norcross, 1992). DiClemente and Prochaska (1982) were the first to propose that individuals changing an addictive behavior move through a series of five stages, as first identified in smokers attempting to quit on their own and smokers in professional treatment programs. An individual can move up and down through the stages with changing motivation levels. Those in the action and maintenance stages of change have already quit smoking. This dissertation focuses on smokers in the pre-contemplation, contemplation, and preparation stages of change. A brief description of the five stages of change applied to the behavior of smoking follows (Prochaska et al., 1992) (see Figure 1.3):

- *Pre-contemplation* is the stage where there is no intention to quit smoking in the foreseeable future, typically within the next six months. There is resistance to recognize smoking as problematic or to modify the behavior. Motivation is low in these individuals.
- *Contemplation* is defined as the stage which an individual recognizes the need to change behavior and is seriously thinking about changing, but has not made a commitment to change. In this stage, individuals are weighing the pros and cons of smoking. Individuals in this stage are at medium level of motivation to quit.
- *Preparation* is the stage where individuals are intending to quit in the next month. Small behavior changes may be seen. A smoker in this stage has had at least one 24-hour quit attempt in the past year. These smokers have high motivation to quit.
- *Action* is when the individual modifies his or her behavior, experiences, or environment in order to overcome smoking. Commitment, time, and energy are needed at this stage. To be in this stage, one must have successfully abstained from smoking for one day to six months.
- *Maintenance* is the stage where an individual works to prevent relapse. This stage begins when the individual has abstained from smoking for six months to an indeterminate time past action.

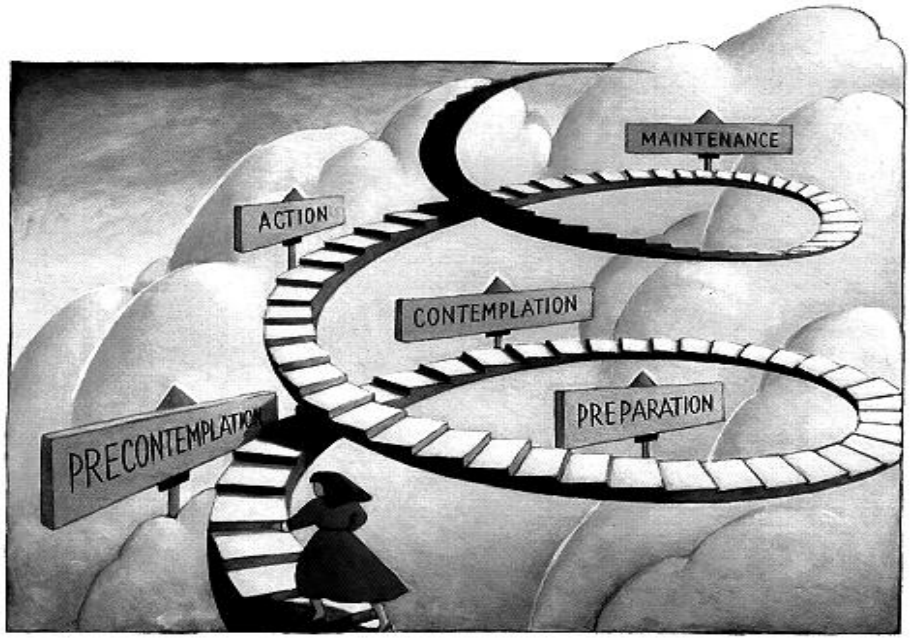

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Figure 1.3. A Spiral Model of the Stages of Change.

Conceptual Model: The Contemplation Ladder as a Measure of Motivation to Quit Smoking

The contemplation ladder (CL) aims to evaluate a smoker's position on a continuum that ranges from having no thoughts of quitting to being engaged in action to make a behavior change (Biener & Abrams, 1991; See Figure 1.4). Supporters of this model claim that compared to the Stages of Change (SOC) model (described above), a continuous measure of readiness is more relevant as an outcome variable, whereas the SOC is more appropriate for targeting interventions and investigating cognitive characteristics at different levels of change (Biener & Abrams, 1991). The CL is measured on a response continuum of 11 points, with the higher rungs representing greater motivation to change.

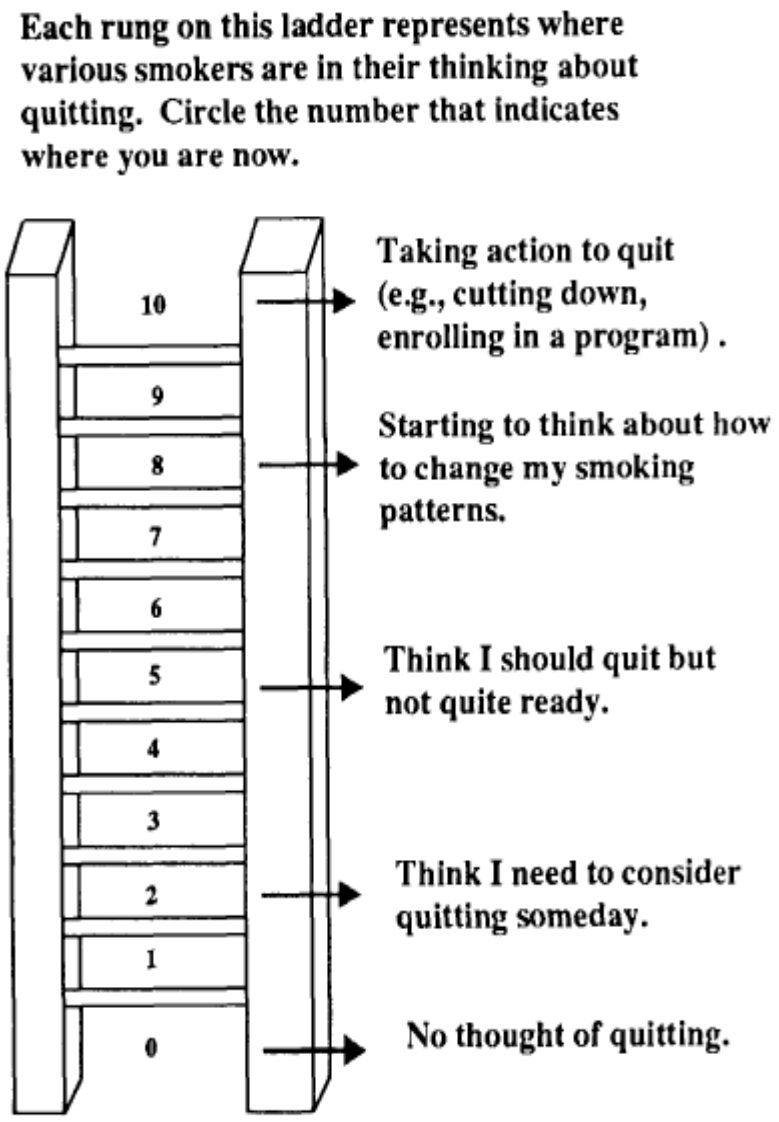

Figure 1.4. The Contemplation Ladder

CHAPTER 2. RISK PERCEPTION AND MOTIVATION TO QUIT SMOKING: A TEST OF THE HEALTH ACTION PROCESS APPROACH

Abstract

The Health Action Process Approach (HAPA) posits a distinction between pre-intentional motivation processes (including risk perceptions) and a post-intentional volition process that leads to the actual behavior change. For the example of smoking cessation, the HAPA predicts that increased risk perceptions would foster a decision to quit smoking. From a cross-sectional perspective, the HAPA predicts that those who do not intend to quit (non-intenders) should have lower risk perceptions than those who do intend to quit (intenders).

Adult smokers participated in a cross-sectional survey. Multiple measures of motivation to quit smoking and risk perceptions for smoking were assessed. ANOVA and contrast analysis were employed for data analysis.

The results were generally supportive of the HAPA. Non-intenders had systematically lower risk perceptions compared to intenders. Most of these findings were statistically significant. The results demonstrated that risk perceptions distinguish non-intenders from intenders. These results suggest that smokers low in motivation to quit could benefit from information and reminders about the serious health problems caused by smoking.

Introduction

Cigarette Smoking is one of the leading causes of preventable death from cardiovascular disease and cancer (USDHHS, 2004), and smokers who quit can reduce their risks associated with these diseases (USDHHS, 2004). Unfortunately, most of the 45 million smokers in the United States do not try to quit smoking during any year, even for a day (Schoenborn et al., 2004).

Two important psychological variables associated with smoking cessation are motivation to quit and health risk perceptions of smoking. The construct of motivation to quit has received much attention in the research literature. The importance of motivation to quit is that some smokers are more motivated to quit than others, and that these differences should be considered when designing smoking cessation programs. Much research on motivation to quit has involved the Stages of Change (SOC) construct, which is part of a larger model known as the Transtheoretical Model (TTM; Prochaska et al., 1992). However, there are many ways to operationalize motivation to quit. Alternative measures of motivation to quit include the contemplation ladder (CL; Beiner & Abrams, 1991) and various measures of intention to quit (Herzog, 2008; Herzog & Blagg, 2007; Kraft, Sutton, & Reynolds, 1999).

Risk perceptions are also an important variable for understanding the process of smoking cessation, because health concerns are the main reason motivating smokers to quit (McCaul, et al., 2006). However, as with motivation to quit, there are many ways to measure risk perception (Weinstein, 1998; Weinstein & Klein, 1996; McCoy, et al., 1992). The results of some studies indicate that smokers perceive smoking to be very risky to one's health (Strecher, 1995). Results of other studies, however, reveal that smokers are irrationally optimistic about their own personal risks as compared to other smokers with similar demographic characteristics and smoking histories (Dillard, et al. 2006; Weinstein & Klein, 1996; Weinstein, Marcus, & Moser, 2005). As a general conclusion, Weinstein, et al. (2005) emphasizes that smokers' risk perceptions are neither rational nor well-informed. Further, smokers can provide inconsistent estimates of risk, depending on how risk is measured. For these reasons, employing multiple measures of risk perception is advisable.

The Relationship between Motivation to Quit and Risk Perceptions

Although motivation to quit and risk perceptions are central variables in smoking cessation research, few theories explicitly define their relationship. The Protection Motivation Theory posits that the appraisal of a health threat (such as smoking) and the appraisal of coping responses result in the intention to perform adaptive responses (i.e., protection and motivation) or may lead to responses that place an individual at health risk (Maddux & Rodgers, 1983). The Protection Motivation Theory proposes that the intention to protect one's self depends upon four factors, one of which is the perceived severity (or risk) of a threatened event (i.e., a heart attack) (Maddux & Rodgers, 1983). Similarly, the Health Belief Model attempts to explain and predict health behavior change, with the concepts of perceived susceptibility and perceived severity used to account for readiness to change a behavior (Glanz, Rimer, & Lewis, 2002). In the case of the Transtheoretical Model (Prochaska & DiClemente, 1983), risk perception is not an explicit component of the model, though health risks could be considered a constituent of the broader "cons of smoking" variable. These theories commonly specify behavioral intentions as the most important predictor of health behaviors (Scholz, Nagy, Göhner, Luszczynska, & Kliegel, 2009). Yet, intentions alone are not sufficient for successful behavior change and studies have shown that intentions leave a large amount of variance unexplained in behavior change (Webb & Sheeran, 2006). Additional behavior change predictors are needed to better understand the process of behavior change (Scholz et al., 2009).

The Health Action Process Approach (HAPA) was used as the theoretical model in this study because it defines several predictors of behavior change and specifies a relationship between level of motivation to quit and degree of risk perceptions (Schwarzer, 2008). Past research has validated the use of the HAPA for smoking behaviors (for example, Scholz et al., 2009). The HAPA proposes that there is a distinction between the pre-intentional motivation process (including risk perceptions) that leads to intention to make a behavior change and the post-intentional volition process that leads to the actual behavior change (Schwarzer, 2008). The volition process can be further sub-divided into a planning phase, action phase, and maintenance phase

(Schwarzer, 2008). In the example of smoking cessation, the HAPA predicts that increased risk perceptions would foster a decision to quit smoking, though other mediating variables also would be involved. From a cross-sectional perspective, the HAPA predicts that those who do not intend to quit (non-intenders) should have lower risk perceptions than those who do intend to quit (intenders).

Operationalizing Motivation to Quit Using the HAPA

Herzog and Blagg (2007) demonstrated that different measures of motivation to quit produce very different distributions of motivation to quit in a given sample. Specifically, the SOC assesses smokers as less motivated to quit as compared to a variety of alternative measures of motivation to quit (Herzog & Blagg, 2007). Given that the HAPA does not recommend any specific measure of motivation to quit, the current study employed two disparate measures of motivation to quit: the SOC and CL. These two measures are known to yield significantly different distributions of motivation to quit within a given sample of smokers (Herzog, Abrams, Emmons, & Linnan, 2000; Herzog & Blagg, 2007). By employing these two measures of motivation to quit, the HAPA can be tested using different underlying assumptions regarding the measurement of motivation to quit.

Hypotheses

Our hypotheses are derived from the HAPA. We predict that smokers low in motivation to quit (i.e., non-intenders) will have lower risk perceptions than those who are medium or high in motivation to quit (i.e., intenders). Further, we hypothesize no significant differences in risk perception between those medium and those high in motivation to quit, as these two groups both are classified as "intenders" within the context of the HAPA. Hypotheses can be summarized as a pattern of relatively "low-high-high" risk perceptions for low (non-intender), medium, and high motivation to quit smokers, respectively. This pattern of predicted means is depicted in Figure 2.1. Hypotheses will be tested for multiple measures of both motivation to quit and risk perceptions.

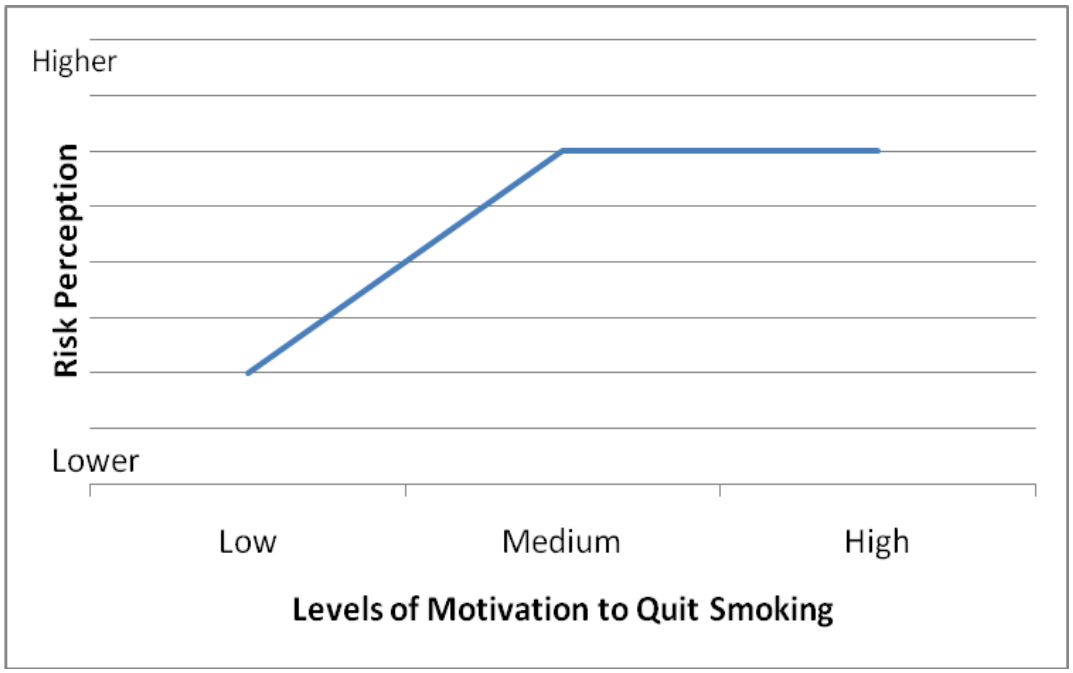

Figure 2.1. Quitting Smoking Intention Levels and Risk Perception

Methods

Participants and Procedures

Participants for this study were recruited using newspaper advertisements and flyers distributed at community events in the Tampa, Florida area. The advertisements and flyers stated that participants would be paid for participating in a survey study. Eligible participants were those who were: (a) 18 years old or over, (b) could read English, (c) had a mailing address, (d) and self-identified as smokers. Potential participants were screened for eligibility requirements on the telephone. Participants were mailed questionnaires along with a stamped and addressed return envelope. Upon receipt of completed questionnaire, participants were mailed a $25 check. This was a cross-sectional study and no follow up questionnaires were sent.

Measures

The data presented in this study were derived from a subset of questionnaires within a 16-page survey on cigarette smoking and smoking cessation. The specific variables analyzed in this article were dispersed throughout the questionnaire to decrease

redundancy for participants. Data on demographics, current smoking behavior, and smoking history also were collected.

Stages of Change (SOC) Algorithm: The SOC construct partitions smokers into three categories. Smokers in the pre-contemplation stage indicated that they do not intend to quit smoking in the next 6 months. Contemplators are smokers who intend to quit in the next sixmonths and (a) are not seriously intending to quit within the next 30 days or (b) have not made at least one 24-hour quit attempt in the past year, or both (a) and (b). Smokers in the preparation stage are seriously intending to quit within the next 30 days and had at least one 24-hour quit attempt during the past year. This version of the SOC algorithm has been employed in several major studies of the TTM (e.g., DiClemente et al., 1991; Fava, Velicer, & Prochaska, 1995). In the current study, precontemplation stage smokers are considered low in motivation to quit and are classified as non-intenders within the context of the HAPA. Contemplation and preparation smokers are considered medium and high motivation to quit, respectively, and smokers in both of these stages are considered intenders for purposes of the HAPA.

The Contemplation Ladder (CL): This instrument employs an 11-point Likert scale depicted as a ladder (Biener & Abrams, 1991). For the current study, low motivation to quit (i.e., non-intenders) was defined by the responses 0 (“No thought of quitting”) to response 2 (“Think I need to consider quitting someday”). Intermediate levels of motivation to quit was defined as responses 3 to 7, centering on response 5 (“Think I should quit, but not quite ready”). High motivation to quit ranged from response 8 (“Starting to think about how to change my smoking patterns”) to response 10 (“Taking action to quit, such as cutting down on smoking, enrolling in a program”). This method of partitioning the CL has been used in past research and has been validated for measuring the readiness of smokers to make a behavior change (Biener & Abrams, 1991; Herzog, et al., 2000). The rationale for partitioning the CL in this manner is to create a variable that contains three levels of motivation to quit. The transformed three-level CL facilitates comparisons with the three-level SOC.

Risk Perception Items: Two categories of risk perception were assessed. The first category measured “absolute risk” of smoking (i.e., “How likely do you think you are to

develop the following health conditions as a result of smoking?"). The second category of risk perception was "relative risk" perception (i.e., "compared to other smokers your same age and sex, how would you rate your risk of getting one of the following conditions?"). Responses ranged from "Very Unlikely" to "Very Likely" on a five point scale for both absolute and relative risk questions. For both categories of risk perception, risk associated with the following smoking-related diseases was assessed: lung cancer, heart disease, emphysema, circulator problems, stroke, and "other types of cancers."

Results

Participant Characteristics

A total of 273 individuals qualified for the study and were sent surveys. Of these, 242 (89%) surveys were completed and returned. The mean age of participants was 47 years old (*SD*=13.19), with more than two thirds (68%) female. The sample was primarily Caucasian (71%), followed by African Americans (23%) and Hispanics (10%). Thirty-three percent of participants had a high school level of education or less. Forty-seven percent of participants were employed, with the remaining participants being either unemployed (20%), retired (13%), or disabled (20%). The median income was between $20,000 and $30,000. Participants smoked at a mean rate of 19.10 cigarettes per day (*SD*=10.90) and had smoked for a mean of 26.08 years (*SD*=13.18).

Data Reduction

The factor structure of the risk perception scales was assessed using principal components analysis (PCA). Separate PCA's were conducted for absolute and relative risk questions, respectively. Each PCA revealed a one-factor structure, leading us to compute composite risk scores. The initial eigen value yielded a one factor solution explaining 77% of the variance for absolute risk variables (eigen value=4.64). A one-factor solution was also found for the relative risk variables (eigen value=4.36) and accounted for 72% of the variance. Other factors had eigen values below 1.00. The alpha level for all risk variables was set at p=0.05. One factor solutions were indicated according to the Kaiser criterion, whereby only factors with eigenvalues greater than 1 are retained (Kaiser, 1960). Scree plots further indicated in graphical representation one factor solutions. According to criteria by Cattell (1966), the place where the smooth

decrease of eigenvalues appears to level off to the right of the plot is the factorial scree. Cronbach's alphas for the six relative risk categories and six absolute risk categories were 0.94 and 0.92, respectively.

Cross-Tabulations of the SOC and CL

Previous research has indicated large and statistically significant differences in the distribution of motivation to quit depending on whether the SOC or the CL had been employed (Herzog, et al., 2000; Herzog & Blagg, 2007). As with previous analyses, a Wilcoxon Signed Ranks Test using the current data revealed that the SOC classified smokers as significantly less motivated to quit compared to the CL ($Z = 7.04$, $p < .05$). The cross-tabulation of SOC by CL is presented in Table 2.1.

Table 2.1. Cross-Tabulation of Stages of Change (SOC) and Contemplation Ladder (CL)

		Contemplation Ladder			
		Low MTQ (%)	Medium MTQ (%)	High MTQ (%)	Sum (%)
Stages of Change	Low MTQ (%)	24	39	6	69 (31%)
	Medium MTQ (%)	5	54	47	106 (47%)
	High MTQ (%)	2	8	38	48 (22%)
	Sum (%)	31 (14%)	101 (45%)	91 (41%)	223 (100%)

*MTQ=motivation to quit

Main Results

We employed ANOVA to test our hypotheses. Contrast analyses within the context of ANOVA (Rosenthal & Rosnow, 1985) were employed to test the specific hypothesis that the means for risk perception would reveal a "low-high-high" pattern for low, medium, and high motivation to quit, respectively (see Figure 2.1). Contrast weights associated with the "low-high-high" predictions were -2, 1, and 1, for low, medium, and high motivation to quit, respectively. These weights were used for both the SOC and CL.

Stage of Change (SOC). Two separate one-way ANOVAs were calculated for SOC: one for absolute risk, and one for relative risk. For absolute risk, there was a significant effect for SOC, $F(2, 234)=4.32$, $p=0.014$, *eta*=0.19. In other words, risk perceptions differed by stage. Contrast analyses revealed that the predicted "low-high-high" pattern of means also was supported for absolute risk, $t(234)=2.83$, $p=.005$, $r=0.18$. For relative risk, neither the main effect of SOC nor the "low-high-high" contrast were statistically significant (each $p>.05$; see Table 2.2).

Table 2.2. Mean Risk Perception by Level of Motivation for the Stages of Change

Level of Motivation to Quit	Absolute Risk Perception Mean(SD)	Relative Risk Perception Mean(SD)
Low MTQ	3.6 (1.00)	3.3 (0.94)
Medium MTQ	3.9 (0.80)	3.5 (0.85)
High MTQ	3.9 (0.91)	3.5 (0.98)

* MTQ=motivation to quit

Contemplation Ladder (CL). Separate one-way ANOVAs (one for absolute risk, and one for relative risk) also were calculated for the CL. Main effects for CL group were obtained for both absolute risk, $F(2, 226)=3.17$, $p=0.044$, *eta*=0.16, and relative risk, $F(2, 224)=5.34$, $p=0.005$, *eta*=0.21). Further, the predicted "low-high-high" contrast was

supported for both absolute risk, $t(226) = 2.41$, $p=.017$, $r=0.16$, and relative risk, $t(224)=3.24$, $p=.001$, $r=0.21$; see Table 2.3)

Table 2.3. Mean Risk Perception by Level of Motivation for the Contemplation Ladder

Level of Motivation to Quit	Absolute Risk Perception Mean(SD)	Relative Risk Perception Mean(SD)
Low MTQ	3.4 (0.95)	3.0 (0.86)
Medium MTQ	3.8 (0.90)	3.4 (0.88)
High MTQ	3.9 (0.87)	3.5 (0.87)

* MTQ=motivation to quit

Discussion

This study assessed risk perceptions of smokers at different levels of motivation to quit. Our hypotheses were derived from the HAPA, which states that risk perceptions differentiate "intenders" from "non-intenders." Using two measures of risk perception and two measures of motivation to quit, the predictions derived from the HAPA were mostly supported. Specifically, low-motivation to quit (i.e., non-intenders) demonstrated low risk perceptions relative to smokers who were medium or high in motivation to quit (intenders). These results suggest that risk perceptions should be considered for motivating smokers who are not intending to quit. The general pattern of results were similar for the SOC and CL, however one difference did emerge. For the SOC, the low-high-high contrast (and main effect of SOC) was confirmed for absolute risk, but not for relative risk. For the CL, main effects and the contrasts were significant for both absolute and relative risk.

Inspection of the means presented in Table 2.2 and Table 2.3 reveals that non-intenders as classified by the CL had lower mean risk perceptions than non-intenders as measured by the SOC. This pattern of results reveals that the distinctions postulated by the HAPA are more clearly evident when the CL is employed, as compared to the SOC. In other words, the quantitative difference between "low" and "high" in the "low-high-

high" contrasts is consistently larger for the CL, as compared to the SOC, particularly for relative risk perception. However, the overall direction and trends in the results were similar for the SOC and CL, as one would expect.

The current study is subject to limitations. The sample used in the analysis was not a random sample from the population of smokers. Instead, participants received monetary incentives to participate in the study, leading to a possible selection bias. However, the sample did appear to be reasonably representative in terms of smoking-related characteristics such as cigarettes per day and motivation to quit. Low-income smokers were well represented in the sample. Further, a fully representative sample was not needed to meet the study objectives.

Conclusion

The overall results demonstrate that risk perception does distinguish non-intenders from intenders. However, these cross-sectional results do not demonstrate the causal direction of this relationship. Further, although the results reveal differences in risk perception across levels of motivation to quit, risk perceptions still were substantial even among the non-intenders. Nonetheless, the results do provide support for the notion that smokers low in motivation to quit can benefit from information and reminders about the serious health problems caused by smoking. Future research should focus on how messages regarding health risks can be incorporated into interventions targeted at smokers who do not intend to quit.

CHAPTER 3. MOTIVATING SMOKERS TO QUIT: INVESTIGATING THE ROLES OF THE PHYSICIAN AND SMOKE-FREE LAWS

Abstract

Both smoke-free laws and physician involvement in quitting smoking are associated with increased motivation to quit, which is essential to encouraging smokers to change their behaviors. Supported by ecological models of health, we examined the differences in perceptions of how those with high, medium, and low motivation to quit smoking perceive smoke-free laws and the extent to which a physician was involved in motivating them to quit. Current everyday adult smokers (N= 387 participants; 56.3% female; mean age of 49 years old) participated in a cross-sectional telephone survey where they were asked about their readiness to quit, physician involvement in quitting smoking and perceptions of smoke-free laws. Chi-square tests and ordinal logistic regression were used to compare smokers by their level of motivation to quit. The differences in perceptions of how those with high, medium, and low motivation to quit smoking existed to the extent to which the physician was involved in motivating smokers to quit and the level of support for smoke-free laws. We were only able to partially support our hypotheses that smokers with lower motivation to quit would have less agreement with smoke-free laws and less physician support than smokers who are more motivated to quit. Physician involvement in motivating patients to quit smoking and smoke-free law perceptions were not significantly correlated ($p>0.05$) with one another. The overall results demonstrated that a physician suggesting to set a specific quit date, providing quit smoking materials, and recommending nicotine replacement therapy were associated with a stronger motivation to quit, while less agreement with smoke-free laws at beaches and at airports were significantly associated with having a low level of motivation. These aspects should be focused on when planning cessation interventions.

Introduction

Smoking is one of the leading causes of preventable death from cardiovascular disease and cancer (USDHHS, 2004). Second-hand smoke has been linked to heart disease and lung cancer in non-smoking adults and sudden infant death syndrome, acute respiratory infections, middle ear disease, and asthma in children (USDHHS, 2006). About 15% of adults in Hawai‘i report smoking cigarettes every day (Pobutsky & Lowery St. John, 2010). Unfortunately, 70% of smokers in Hawai‘i are not motivated to quit within the next month (Pobutsky & Lowery St. John, 2010).

The construct of motivation to quit smoking has been identified as a predictor of successful quitting (Osler & Prescott, 1998; Rose, Chassin, Presson, & Sherman, 1996). The importance of both policy for smoking and physician involvement have been documented as factors associated with increased motivation to quit (Fiore, 2008; Hopkins et al., 2010; Kottke et al., 1988; Lancaster et al., 2000). Increasing motivation is essential for encouraging smokers to change their behaviors and should be considered when designing smoking cessation programs (McCaul et al., 2006).

The Stages of Change (SOC) construct, which is part of the Transtheoretical Model (TTM), has been used to describe motivation to quit (Prochaska et al., 1992). The SOC divides smokers into three categories: pre-contemplation, contemplation, and preparation. Smokers in the pre-contemplation stage do not intend to quit smoking in the next six months. Contemplators are smokers who intend to quit in the next 6 months and (a) are not seriously intending to quit within the next 30 days or (b) have not made at least one 24-hour quit attempt in the past year, or both (a) and (b). Smokers in the preparation stage are seriously intending to quit within the next 30 days and had at least one 24-hour quit attempt during the past year (Prochaska et al., 1992). Therefore, pre-contemplators have low motivation to quit, contemplators have medium motivation, and preparers have high motivation to quit.

A limitation of the TTM, however, is that it does not adequately address environmental factors that influence behavior change by not including environmental evaluation processes. Therefore, it is necessary to look at broader ecological approaches to behavior change. Motivation is supported by ecological models of health where the

health of a population is influenced both by the characteristics of the people in the population (such as physician involvement in quitting smoking), the characteristics of the environment in which they live (such as policy), and an interaction between people and environment (Bandura, 1986; Stokols, 1992).

Physician Involvement in Motivating Patients to Quit Smoking

Physician involvement has been recognized as factor in increasing motivation to quit smoking (Eckert & Junker, 2001; Kottke et al., 1988; Lancaster et al., 2000). A meta-analysis of 31 studies comprised of 26,000 smokers revealed that even brief advice from a physician about quitting smoking will increase the quit-rate among smokers (Kottke et al., 1988). Literature has indicated that patients want and expect their providers to ask them about their smoking habits and provide them with necessary interventions when they are ready to quit (Kviz et al., 1997). Unfortunately, advice from a physician is typically only provided to smokers who are motivated to quit (Eckert & Junker, 2001).

Physicians have been advised to help patients quit by following cessation guidelines based on the "5A's" (ask, advise, assess, assist, and arrange; Fiore et al., 2008). Zimmerman, Olsen, and Bosworth (2000) used these guidelines to match smoker's level of motivation to quit (as measured through the SOC) to physician intervention type. As displayed in Table 3.1, those with different levels of motivation to quit require varying interventions from a physician (Woody, DeCristofaro, & Carlton, 2008).

Table 3.1. Relationship among Stage of Change, Smoking Status, Level of Motivation, and Provider Support*

Stage of Change	Smoking Status	Level of Motivation	Physician Support
Pre-contemplation	Currently smoking	Low	Ask about smoking status and quitting at every patient visit
Contemplation	Currently smoking	Medium	Ask about smoking status and quitting at every visit; provide educational materials regarding benefits of quitting and risks of smoking and cessation aids
Preparation	Currently smoking	High	Quit date set; non-pharmaceutical and pharmaceutical aids are provided; follow-up appointment set for 1 week after the quit date

*Woody, DeCristofaro, & Carlton, 2008

Smoke-Free Laws

In addition to the expert support from the physician, the broader environment (such as restrictions on smoking) impacts smokers. Implementing smoke-free laws as a mode of increasing motivation to quit has been shown to be successful in decreasing smoking rates (Frieden et al., 2005; Hammond et al., 2004; Hopkins et al., 2010).

Most studies addressing the environmental impact of smoke-free laws were limited to participants who were required to quit smoking completely because of a medical hospitalization (Longo et al., 1998), incarceration (Cropsey & Kristeller, 2003), or basic military training (Clements-Thompson, Klesges, Haddock, Lando, & Talcott,

1998). Few studies have examined the impact that these laws have on smokers who were not required to quit full time, such as only being banned from smoking at work or in a restaurant. Therefore, these "part-time" smoke-free laws may have varying impact on a smoker depending on level of motivation to quit. Smokers with a low motivation to quit have been recognized as having both less intention to quit despite a smoking ban and lower level of agreement with a smoking ban than smokers who are more motivated to quit smoking (Cropsey & Kristeller, 2003).

Recognizing the potential positive impact of smoke-free laws, an increasing number of communities have adopted smoke-free laws. For example, to protect Hawai‘i citizens from the health risks of second-hand smoke, Hawai‘i's smoke-free law took effect on November 16, 2006, which outlawed all smoking in enclosed public areas, places of employment, and within 20 feet of doorways, windows, and ventilation intake areas (Hawai‘i Department of Health, 2006).

Hypothesis

There is little research investigating the impact of physician advice to quit combined with smoke-free laws perceptions as motivators for quitting smoking, as supported by ecological models of health. The combination of these factors warrants research in order to strengthen the synergy and methods for increasing motivation.

Therefore, the purpose of this study is to examine the differences in how those with high, medium, and low motivation to quit smoking perceive the Hawai‘i smoke-free laws and the role of the physician in increasing their motivation to quit. It is hypothesized that smokers with low levels of motivation to quit have had less physician involvement in addressing their smoking habits and have lower agreement with smoke-free laws than those with high motivation to quit. Further, because both motivators are potentially important for increasing cessation rates, we explored the relationship between these motivators in order to determine their impact on increasing motivation to quit. It is hypothesized that there would be a positive correlation between increased physician involvement and positive smoke-free law perceptions. We further hypothesize that physician involvement and smoke-free law combined correlates with higher motivation to quit compared to either strategy alone.

Methods

The data presented in this analysis were derived from the 2006 Hawai‘i Adult Tobacco Survey (HATS) sponsored by the Hawai‘i State Department of Health, Tobacco Prevention and Education Program. The HATS was a random-digit-dial telephone survey of the civilian, non-institutionalized Hawai‘i population aged ≥18 years that was conducted from September 2006 to March 2007. The core HATS questions included 49 questions for current smokers, 38 questions for former smokers, and 34 questions for those who have never smoked and included questions about tobacco use, tobacco use cessation, second-hand smoke exposure, smoke-free workplace policies, risk perception, social influences, and demographic questions. This study has been approved by the University of Hawai‘i Committee on Human Studies.

Participants and Procedures

Participants for this study were chosen through random-digit-dialing throughout Hawai‘i. Eligible participants for the phone interview included adult (18 and over) smokers, former smokers, and those who have never smoked. Survey data were collected using a uniform, detailed telephone-calling protocol. Telephone numbers that received at least 15 call attempts, at least three weekday calls, three weeknight calls, and three weekend calls were assigned a final disposition code of “unable to reach” and no longer called. Surveys were administered over a period of seven months without longitudinal follow up.

Measures

Tobacco use questions included current and past use of cigarette smoking, cigar smoking, smokeless tobacco, and pipe smoking. For purposes of this study, we used data from only current, everyday cigarette smokers (defined as smokers who reported smoking 100 or more cigarettes in their lifetime and smoke everyday), as our focus is on current smokers’ motivation to quit. Questions were developed by the Centers for Disease Control and Prevention and the Hawai‘i State Department of Health's Tobacco Prevention and Education Program.

Measure of Motivation to Quit Smoking: The current study used the SOC algorithm as a measure of motivational levels to quit smoking, which has been validated in major studies of the TTM (e.g., DiClemente et al., 1991; Fava et al., 1995). For the purposes of this study, the SOC algorithm was adapted to define preparers as those who are seriously intending to quit within the next 30 days, regardless of a 24-hour quit attempt.

The adapted questionnaire used in this study defined smokers in the pre-contemplation stage as those answering "no" to "Are you seriously considering stopping smoking within the next six months?" Contemplators were categorized as answering "yes" to "Are you seriously considering stopping smoking within the next six months?" and answering "no" to "Are you planning to stop smoking within the next 30 days?" Preparers were defined as those answering "yes" to "Are you planning to stop smoking within the next 30 days?"

Measure of physician involvement in motivating patients to quit smoking: A total of six questions measuring physician involvement were asked: (1) "in the past 12 months, have you seen a doctor, nurse, or other health professional to get any kind of care for yourself?" "Did any doctor, nurse, or other health professional: (2) provide advice not to smoke (3) provide quit smoking material (4) suggest that you use a smoking cessation class, program, quit line, or counseling, and provide you with booklets, videos, or other materials to help you quit smoking on your own (5) prescribe or recommend a patch, nicotine gum, nasal spray, an inhaler, or pills such as Zyban (i.e., recommend nicotine replacement therapy), and (6) suggest that you set a specific date to stop smoking?" Participants could respond as "yes," "no," or "don't know." "Don't know" responses comprised less than 5% of responses and were excluded from the analysis. These questions were derived from the "5 A's" (Ask, Advise, Assess, Assist, Arrange) of smoking cessation developed by the US Department of Health and Human Services (Fiore et al., 2008) and have been shown to be reliable (Lawson, Flocke, & Casucci, 2009).

Measure of Hawai'i smoke-free law perceptions: A total of five questions regarding smoke-free laws were asked of participants. These questions included whether

participants thought smoking should be allowed in restaurants, bars/night clubs, airports, by entrances of public buildings, and on beaches. Participants were able to answer "allowed in all areas," "allowed in some areas," "not allowed at all," or "don't know." "Don't know" responses comprised less than 5% and were excluded from the analysis.

Data Analysis

A goal of the analysis was to determine "Does a physician's involvement in motivating patients to quit smoking and perceptions of smoke-free laws differ between motivational levels of quitting smoking?" In order to test this hypothesis, percentages for physician involvement and perceptions of smoke-free laws were compared among the three levels of motivation using the chi-square test of association.

Another goal of the analysis was to investigate the relationship between physician involvement in motivating patients to quit smoking and smoke-free law perceptions. We explored the relationship between physician involvement and perceptions of Hawai‘i smoke-free laws using Cramer's V correlations. This analysis was run with all data and then again separately for those with low, medium and high motivation to quit smoking.

Another goal was to determine, "Does physician involvement in motivating patients to quit smoking and perceptions of smoke-free laws combined together predict an increase in motivation to quit?" We combined these two constructs in order to determine if a combination of population and environmental influences was associated with an increase in motivation compared to just one construct alone. In particular, ordinal logistic regression was used to estimate the association of smoke-free laws and physician involvement with motivation level to quit smoking. The significance of the interaction effect of these variables was evaluated using a global Wald test for the cross-product terms.

Results

Participant Characteristics

A total of 3,965 participants completed the telephone survey (63.1% female; mean age of 53 years old, SD=16.1). The cooperation rate (number of interviews conducted divided by the number of eligible respondents contacted) was 63.9%, and the response rate (number of interviews conducted divided by the number of eligible respondents, including those not reached) was 36.3%.

The present study focused on current, everyday cigarette smokers (N=331). The majority of current, everyday smokers were female (56.3%) and the average age was 49 years old (SD=12.9). With regards to stage of change, 49% were pre-contemplators, 30% were contemplators, and 21% were preparers.

Physician Involvement in Motivating Patients to Quit Smoking

The percentage of smokers reporting that their physician provided them with quit smoking materials significantly varied across motivational levels ($p<0.05$), with the percentage increasing with motivation: 26% for low, 31% for medium, and 51% for high motivation levels. Similarly, the percentage of smokers reporting that their physician recommended nicotine replacement therapy (NRT) significantly varied across motivational levels ($p<0.05$): 23% for low, 34% for medium and 49% for high motivation groups. A significant difference was also seen across motivation levels ($p<0.05$) between the percentage of smokers reporting that their physician recommended setting a quit date: 20% for low, 35% for medium, and 45% for high motivation levels. Having a physician suggest using a smoking cessation class, program, quit line, or counseling was borderline significant ($p=0.06$) and supportive of the direction of the hypothesis (See Table 3.2).

No significant differences were found between motivational levels and seeing a physician or receiving advice not to smoke ($p >0.05$).

Table 3.2. Cross-Tabulations of Stage of Change with Physician Involvement

	Stage of change (level of motivation)				
	PC (Low)	C (Medium)	P (High)	Total	*p*-value
	163	100	68	331	
Physician interactions	%	%	%	%	
Saw a physician	73.0%	66.0%	75.0%	71.3%	0.36
Among those that saw a physician:	119	66	51	236	
Provided advice not to smoke	72.0%	75.8%	84.3%	75.7%	0.23
Provided quit smoking materials	25.9%	30.6%	51.2%	33.3%	0.02*
Suggests using a smoking cessation class, program, quit line, or counseling	28.9%	28.6%	48.8%	33.5%	0.06+
Recommended nicotine replacement therapy	22.6%	34.0%	48.8%	32.2%	0.01*
Recommended to set a quit date	20.0%	34.7%	45.2%	30.1%	0.01*

*=significant chi-square at $p<0.05$.; += borderline significant; **PC=pre-contemplator, C=contemplator, P=preparer

Perceptions of Smoke-Free Laws

A significant difference in perceptions of smoke-free beaches varied across motivation levels ($p<0.05$). Smokers with low motivation to quit were more likely at 52% to believe that smoking should be allowed at all areas of the beach than the other groups (39% for medium and 40% for high motivation groups; See Table 3.3).

A significant difference was also found across motivation levels ($p<0.05$) for perceptions of smoke-free airports. Smokers with low motivation to quit were more likely to believe that smoking should not be allowed at all in the airport (7% versus 2% for medium and high motivators). On the other hand, smokers with low motivation to quit also reported a higher percentage of believing that smoking should be allowed in all areas of the airport compared to those with high motivation (76% of low versus 67% of high), but lower than those of medium motivation (76% of low versus 84% of medium; see Table 3.3).

No significant differences were found between motivational levels and perceptions of smoking at a bar/night club, at entrances to buildings, or at restaurants ($p>0.05$) (see Table 3.3).

Table 3.3. Cross-Tabulations of Stage of Change With Smoke-Free Law Perceptions

		Stage of change (level of motivation)				
		PC (Low)	C (Medium)	P (High)	Total	*p*-value
Perceptions of smoke-free laws at:	**Should be allowed:**	163	100	68	331	
		%	%	%	%	
Beaches	In all areas	52.2%	38.8%	40.3%	45.7%	0.02*
	In some areas	43.5%	45.9%	47.8%	45.1%	
	In no areas	4.3%	15.3%	11.9%	9.2%	
	Total	100.0%	100.0%	100.0%	100.0%	
Airports	In all areas	75.6%	84.0%	67.2%	76.5%	
	In some areas	17.5%	14.0%	31.3%	19.3%	0.01*
	In no areas	6.9%	2.0%	1.5%	4.3%	
	Total	100.0%	100.0%	100.0%	100.0%	
Bars / nightclubs	In all areas	23.7%	18.4%	17.2%	20.8%	
	In some areas	58.3%	64.3%	57.8%	60.1%	0.53
	In no areas	17.9%	17.3%	25.0%	19.2%	
	Total	100.0%	100.0%	100.0%	100.0%	
Entrances to buildings	In all areas	17.6%	12.0%	9.1%	14.2%	
	In some areas	35.8%	39.0%	39.4%	37.5%	0.50
	In no areas	46.5%	49.0%	51.5%	48.3%	
	Total	100.0%	100.0%	100.0%	100.0%	
Restaurants	In all areas	3.2%	1.0%	3.0%	2.5%	
	In some areas	36.1%	31.0%	29.9%	33.2%	0.62
	In no areas	60.8%	68.0%	67.2%	64.3%	
	Total	100.0%	100.0%	100.0%	100.0%	

*=significant chi-square at $p<0.05$. ; ** PC=pre-contemplator, C=contemplator, P=preparer

Relationship Between Physician Involvement in Motivating Patients to Quit Smoking and Smoke-Free Law Perceptions

Few significant correlations were found between physician involvement in motivating patients to quit smoking and smoke-free law perceptions (See Table 3.4). Analysis of all smokers regardless of motivation level indicated a statistically significant relationship between perceptions of whether smoking should be allowed in the airport and physician involvement in advising smokers to not smoke (Cramer's V=.161, $p<0.05$). For smokers with low motivation to quit, a statistically significant relationship was found between perceptions of whether smoking should be allowed in the airport and physician involvement in advising smokers to not smoke (Cramer's V=.250, $p<0.05$). A significant relationship was found between perceptions of whether smoking should be allowed at the entrances to public buildings and physician involvement in suggesting smoking cessation assistance (Cramer's V=.391, $p<0.05$) for smokers with medium motivation to quit.

No significant relationship was found between physician involvement and smoke-free law perceptions for smokers high in motivation to quit. However, a moderate association was indicated by Cramer's V=.370 ($p=0.06$), according to guidelines by Rea and Parker (1997), for perceptions of smoking at entrances to public buildings and physicians that gave smoking cessation materials.

Correlations of $p<0.05$ was considered statistically significant. As there are multiple variables for both physician involvement and perceptions of smoke-free laws, more stringent criteria would be the Bonferroni corrected value of 0.01. However, due to multiple comparisons increasing Type I error rates, a Bonnferroni adjustment would result in no significant correlations.

Table 3.4. Correlations of Physician Involvement with Perceptions of Smoke-free Laws Across Motivation Level

			Physician Involvement (Cramer's V)					
			Saw a physician	Advice not to smoke	Suggested NRT	Set quit date	Suggested cessation assistance	Gave cessation materials
Smoke-free Laws (Cramer's V)	Restaurant	PC	.059	.106	.084	.119	.107	.118
		C	.130	.216	.104	.155	.125	.097
		P	.264	.145	.241	.038	.126	.226
		All Smokers	.024	.068	.106	.063	.056	.111
	Bar/Night Club	PC	.067	.092	.213	.110	.117	.158
		C	.070	.246	.167	.161	.196	.243
		P	.095	.077	.203	.125	.238	.140
		All Smokers	.060	.027	.070	.069	.037	.140
	Beach	PC	.068	.059	.157	.085	.054	.131
		C	.067	.217	.169	.164	.211	.184
		P	.083	.232	.236	.169	.109	.203
		All Smokers	.027	.105	.077	.059	.034	.082
	Airport	PC	.053	.250*	.219	.121	.131	.138
		C	.065	.167	.103	.152	.122	.097
		P	.226	.032	.034	.237	.088	.101
		All Smokers	.043	.161*	.127	.142	.107	.097
	Entrance to public buildings	PC	.029	.154	.134	.063	.049	.174
		C	.144	.195	.130	.239	.391*	.166
		P	.066	.162	.128	.250	.279	.370
		All Smokers	.031	.118	.030	.066	.146	.089

*significant at $p<0.05$; ** PC=pre-contemplator, C=contemplator, P=preparer

Does Physician Involvement in Motivating Patients to Quit Smoking and Smoke-Free Laws Combined Predict an Increase in Motivation of Smokers To Quit?

Motivation to quit was not significantly predicted by perceptions of smoke-free laws ($p>0.05$). However, physician involvement in motivating patients to quit smoking was a significantly predictor of motivation to quit [$\chi^2(4, N = 170) = 11.71, p<0.05$] (See Table 3.5).

Table 3.5. Predictors of Motivation Level

Model*	χ^2	**df**	***p*-value**
Physician Involvement	11.71	4	$P<0.05$**
Smoke-free Laws	16.27	10	$P=0.09$

* Based on ordinal logistic regression; **significant at $p<0.05$

There was no interactive effect between social and environmental influences. Although one interaction between nicotine replacement therapy and airports ($p<0.05$) was suggestive, this significant interaction disappeared when adjusting for the 30 multiple comparisons (See Table 3.6).

Table 3.6. *P*-Values for Interaction Effect of Physician Involvement and Smoke-free Laws*

	Perceptions of smoke-free laws at:				
Physician involvement	Beaches	Airports	Bars / nightclubs	Entrances to buildings	Restaurants
Saw a physician	0.96	0.23	0.99	0.97	0.46
Provided advice not to smoke	0.23	0.98	0.54	0.47	0.82
Provided quit smoking materials	0.31	0.57	0.90	0.18	0.47
Suggests using a smoking cessation class, program, quit line, or counseling	0.93	0.21	0.46	0.46	0.99
Recommended nicotine replacement therapy	0.09	0.05**	0.09	0.49	0.32
Recommended to set a quit date	0.78	0.10	0.54	0.39	0.86

* Based on a 2 degree of freedom Wald test of cross-product terms in ordinal logistic regression; **significant at $p<0.05$

Discussion

This study examined whether differences existed between those with high, medium, and low level of motivation to quit smoking with regards to having a physician involved in their quit smoking process and perceptions of smoke-free laws. According to ecological models of health, both factors are important to address when developing support programs for smoking cessation.

In support of our hypothesis, smokers with lower motivation to quit were less likely to receive physician recommendations for using NRT compared to smokers with

higher motivation. Similarly, smokers with lower motivation to quit were less likely to receive advice to set a quit date and to be given materials on quitting smoking from their physician compared to those with a higher motivation to quit. Having a physician suggest using a smoking cessation class, program, quit line, or counseling was borderline significant. These findings are consistent with recommendations listed in Table 3.1 where pre-contemplators should receive more general advice than those in contemplation or preparation. This indicates that it does make a difference at which motivational level a smoker is at for a physician recommending the use of NRT, receiving advice on setting a quit date, being provided with materials for quitting smoking, and having a physician suggest a smoking cessation class. A possible explanation for this is that physicians may tailor their advice and give action-oriented messages only to smokers who are ready to quit. In addition, smokers who are motivated to quit may be more inclined to ask their physician for NRT or smoking cessation materials than smokers who are not motivated to quit. Lastly, this may be due to a physician having less confidence in how to address smokers who are not ready to quit (Kottke, Solberg, & Brekke, 1990; Ockene & Ockene, 1996).

Results showed that there was no difference by motivational level in the percentage seeing a physician or receiving advice not to smoke. These finding are not consistent with the physician intervention recommendations by Woody et al. (2008) and other literature that suggests that smokers less motivated to quit are the least likely to be urged to quit by health professionals (Pollak et al., 2002; Sesney, Kreher, Hickner, & Webb, 1997; Eckert & Junker, 2001). More research is needed to explore why these factors do not vary across motivation levels and to eliminate the possibility of random findings.

Differences in perceptions of smoke-free laws across motivation levels were found. We were only able to partially support past literature that smokers with lower motivation to quit are less likely to support smoke-free laws than smokers who are more motivated to quit (Crospey & Kristeller, 2003). For example, with an increase in motivation level, a significant decrease in perceptions that smoking should be "allowed in all areas" of the beach was seen. However, smokers with low and high motivation

reported a lower percentage of agreeing that smoking should not be allowed at all at the beach than those with medium motivation to quit. This discrepancy indicates that phrasing of questions may have an impact on responses. A significant difference was also found between levels of motivation and agreeing that smoking should be allowed at the airport. In this case, however, we were not able to support the hypothesis that smokers higher in motivation would have more support for smoke-free laws (Crospey & Kristeller, 2003). Smokers with high motivation to quit indicated the least support for banning smoking "in all areas" of the airport, although they did show the highest support for banning smoking "in some areas." In addition, smokers with low motivation agreed more that smoking should be allowed "in no areas." More research is needed to explore this discrepancy. It appears more factors may come into play when measuring perceptions of smoking in airports.

Most relationships between physician involvement in motivating patients to quit smoking and smoke-free law perceptions were not statistically significant. This may indicate that using these two variables together do not make for a stronger intervention. One relationship that did stand out, however, was between smoker's perceptions of whether smoking should be allowed at the airport and physician involvement in advising smokers to not smoke for all smokers and for smokers with low motivation to quit. A significant relationship was also seen between entrances to public buildings and suggested cessation assistance from a physician for those with medium motivation. These effects could be a random finding and results should be interpreted with caution as a result of an inflated Type I error rate.

We were not able to support our hypothesis that physician involvement and smoke-free laws combined correlate with an increase in motivation of smokers to quit compared to either strategy alone, as would have been predicted by ecological models of health where population health is influenced by people in the population (i.e., the physician) and the environment (i.e., smoke-free laws) (Bandura, 1986; Stokols, 1992). As these two factors have not been explored together in the literature, future research is needed to draw conclusions about this hypothesis. Further, perceptions of smoke-free laws alone did not have a significant relationship with motivation level, although past

research has indicated that smoke-free laws do increase motivation to quit (Frieden et al., 2005; Hammond et al., 2004; Hopkins et al., 2010). We did, however, find that physician involvement in motivating patients to quit smoking is related to the level of motivation to quit smoking. Therefore, physician involvement in motivating patients to quit smoking may be a key factor in motivating smokers to quit, as has been identified in previous literature (Kottke et al., 1988; Lancaster et al., 2000).

Limitations to this study exist. As this was a cross-sectional study, we cannot infer causation. Any influences of directionality, such as the higher motivation group receiving more physician advice to use NRT, could also be in the other direction. For example, smokers higher in motivation to quit may have asked their physician for NRT more than those with lower motivation. It is also unclear whether our results reflect a pre-existing motivation or an actual increase in motivation.

The Stages of Change model defines smokers in the preparation stage as planning to quit in the next 30 days and having at least one 24-hour quit attempt in the past year (Velicer et al., 1995). However, the HATS defined smokers in the preparation stage as only planning to quit in the next 30 days, regardless of a past 24-hour quit attempt. The preparation stage combines intention and behavior change, which was not captured in the HATS definition. Lastly, bias, such as social desirability, may have been introduced into the study as a result of self-reported data and recall. However, research has indicated that self-reporting of smoking behaviors tends to be accurate (Patrick et al., 1994).

Conclusion

The overall results demonstrate that specific aspects of physician involvement to quit smoking and smoke-free laws are related to motivation. These aspects should be considered when planning interventions. Further research is needed to understand why only certain aspects of these factors are related to motivation. More research combining social and environmental factors to understand and capitalize on the potential synergy is also needed.

CHAPTER 4. MOTIVATIONAL FACTORS FOR QUITTING SMOKING: A QUALITATIVE ANALYSIS USING FOCUS GROUPS OF EX-SMOKERS

Abstract

Smoking is one of the leading causes of preventable death in the United States. For those who are able to overcome smoking, the chances of getting cancer and other chronic diseases greatly decrease. However, among smokers who make a serious attempt to quit, about 60% will relapse. Inconsistencies in the literature exist as to the primary reasons smokers have for quitting smoking. The specific aims of this study are to (1) identify factors that influenced cessation, (2) investigate how the final quit attempt differed from previous attempts (if applicable), and (3) explore methods for staying quit. A sample of adult male and female (18 years and older) successful ex-smokers living in Hawai‘i were recruited for a series of focus groups. Five main open-ended questions along with several probing questions were asked. Additional questions were posed as needed to follow up in more detail about ideas shared by participants or to elicit further answers or conversations. Based on key themes identified from the focus groups, motivational factors necessary for successful smoking cessation include the following: (1) highlight factors that predict successful quitting, (2) use relative risk perceptions and personal stories, (3) increase self-efficacy, (4) obtain social support, (5) develop a quitting plan, and (6) learn to manage external factors. Motivation is a key element needed for successful cessation from smoking and should be employed in smoking cessation programs.

Introduction

Smoking is one of the leading causes of preventable death in the US, shortening male smokers' lives by 13.2 years and female smokers' lives by 14.5 years (USDHHS, 2000). Further, smoking is a major cause of cancer, heart disease, aneurysms, bronchitis, emphysema, and stroke (ACS, 2009). Fortunately, for those who are able to quit smoking and remain a "non-smoker," defined as abstaining from smoking for at least six months (Prochaska et al., 1992), their chances of getting cancer and other diseases greatly decrease (ACS, 2009). However, among smokers who make a serious attempt to quit, about 60% will relapse (Hymowitz et al., 1997).

Theories of health education and promotion provide insight to what leads an individual to make the decision to quit smoking through concepts including knowledge, awareness, intentions, self-efficacy, and social influence (Glanz et al., 2002). Many of these leading theories also address motivation to change a health behavior. For example, the Health Belief Model stipulates that a person's health-related behavior depends on perceptions of four areas: the severity of a potential illness, the person's susceptibility to that illness, the benefits of taking a preventive action, and the barriers to taking that action (Janz & Becker, 1984). The model also incorporates cues to action (e.g., leaving a written reminder not to smoke) and the construct of self-efficacy. The Precaution Adoption Model (Weinstein, 1988) and Protection Motivation Theory (Rogers, 1983) assert that perceived susceptibility to a disease influences behavior change. Motivation can be increased, therefore, by raising the awareness of a person's risk of harm caused by smoking. In addition, the Self-Determination Theory defines intrinsic (internal, value-based awards) and extrinsic (external, tangible awards) sources of motivation and how each can lead to cognitive development (Ryan & Deci, 2000). Motivation is also commonly conceptualized as readiness to change within the Transtheoretical Model (DiClemente & Prochaska, 1985). Varying levels of motivation correspond to different stages of change. Smokers with little motivation to quit are classified as pre-contemplators, smokers with medium level of motivation to quit are contemplators, and smokers preparing to make a quit attempt are classified as being in the preparation stage of change. As a last example, the Theory of Planned Behavior (Ajzen, 1991) argues that a

greater sense of personal control, combined with a person's attitude toward the behavior and the influence of a person's social environment, is linked with greater intention to do a health behavior, such as smoking cessation (Taylor, 2002).

Some factors that contribute to an individual making the decision to quit smoking include beliefs about the benefits of quitting (West, McEwen, Bolling, & Owen, 2001), medical advice or health reasons (Lader & Goddard, 2004), addiction, and past quit attempts (Royal College of Physicians, 2000). Further, successful quitting has been associated with older age, higher education or socioeconomic status, low prior consumption of cigarettes, and living with a non-smoking spouse or cohabitant (Osler & Prescott, 1998). Motivation to quit smoking is another factor that has been identified to predict successful quitting, even after adjusting for other known predictors of cessation, such as those just mentioned, as well as less dependence on nicotine, lower levels of environmental stress, less concern about weight gain, and pregnancy (Osler & Prescott, 1998; Rose et al., 1996). Increasing motivation is essential in moving smokers to change their behaviors (McCaul et al., 2006). Some motivating factors have been identified in the literature as health, social concerns, and financial considerations, with health being the top motivator (McCaul et al., 2006). However, other studies disagree with these conclusions. For example, in a cohort of current and former smokers followed for 13 years, Hyland et al. (2004) found that measures of motivation were less predictive of cessation than measures of nicotine dependence and age.

Because of this inconsistency, more research is needed to identify factors that increase motivation to quit smoking and how these may vary across populations. Hawai‘i provides a distinctive population of smokers compared to most of the US. Hawai‘i has a lower percentage of adults who smoke, a lower mean number of cigarettes smoked per day, and less Caucasians and more Asians and Pacific Islanders who smoke (CDC, 2008a). About 15% of adults in Hawai‘i report smoking cigarettes every day (Pobutsky & Lowery St. John, 2010). Males, those within the ages of 18-24, residents living on neighbor islands and Native Hawaiians have the largest prevalence of smoking in Hawai‘i (CDC, 2008a; Pobutsky & Lowery St. John, 2010). Unfortunately, 70% of smokers in Hawai‘i are not motivated to quit within the next month (Pobutsky & Lowery

St. John, 2010). Reaching smokers who are unmotivated to quit is essential for improving the health of Hawai‘i's residents. Therefore, the specific aims of this study are to (1) identify factors that influenced cessation, (2) investigate how the final quit attempt differed from previous attempts (if applicable), and (3) explore methods for staying quit.

Methods

Participants

A sample of adult male and female (18 years and older) successful ex-smokers (see below for criteria) were recruited to participate from the Honolulu, Hawai‘i area through flyers posted around the University of Hawai‘i-Mānoa campus, social networking sites (such as Facebook and Craigslist), local public health association newsletters and newspapers, and word of mouth. Possible participants were screened according to the following inclusion criteria: (1) abstained from smoking for a minimum of six months to five years (Larabie, 2005; Prochaska & DiClemente, 1983), (2) adults age 18-65, (3) smoked for a minimum of one consecutive year, and (4) smoked a minimum of half a pack (10 cigarettes) a day.

Procedures

The following demographic information was collected prior to the start of the focus group by questionnaire: (1) age, (2) gender, (3) ethnicity, (4) marital status and (5) years of education. Smoking history was also included in the questionnaire: (1) age at initiation, (2) age at cessation, (3) number of years smoked, (4) average number of cigarettes smoked per day, (5) brand mostly smoked, (6) who else in the household smoked or still smokes, (7) number of quit attempts, (8) methods used to try to quit smoking, and (9) what method was used for the final quit attempt (See Appendix A for questionnaire).

A total of four focus groups were conducted. The focus group discussions lasted an average of 60 minutes and were moderated by the author of this dissertation study. Focus groups were held in a classroom at the University of Hawai‘i-Mānoa campus. The discussions were digitally recorded with the participant’s prior consent. The discussions were digitally recorded with the participant’s prior consent (See Appendix B for consent form) and notes were taken by an assistant researcher. As the participants responded to

questions, the facilitator used a flip chart to record key concepts and responses to ensure accuracy of ideas.

The open-ended focus group discussion consisted of five main questions along with several probing questions (See Appendix C for focus group guide). The facilitator posed additional questions as needed to ask for more details about ideas shared by participants or to elicit further answers or conversations. These questions ensured that needed information was gathered to reach the study goals.

A gift card worth $20, $5 parking reimbursement, and light refreshments (which were available before and during the focus group) were given as incentives for participation. This study was approved by the University of Hawai‘i Committee on Human Studies.

Data Analysis

Recorded data were transcribed verbatim by the author. In order to ensure reliability, 25% of the transcripts were independently scored and compared to the focus group facilitator's scores. Agreement on 80% or more of the themes was deemed adequate. If reliability was less than 80%, consensus was reached between the focus group facilitator and the independent scorer. Inter-reliability agreement was 94%. Initial codes were used to group similar ideas to form broader codes to develop central themes and categories. Only the themes relating to the stated aims are presented.

Results

Focus Group and Participant Descriptives

A total of 15 people inquired about the focus groups and 12 participated. Four participants signed up for focus group #1, but two did not show up. Another five participants were scheduled for focus group #2, but one did not show up. Focus groups #3 and #4 each had three people. One person who inquired about participation did not qualify and two other people were not able to attend on the dates set for the focus groups.

A majority of participants were in the 26-30 age group (41%), female (67%), Caucasian (75%), single/never married (84%), and had a masters degree (42%) (See Table 4.1). The average age that participants started smoking was 15.3 (SD=3.6) years old and quit smoking at an average age of 26.4 (SD=7.1). Participants smoked for an

average of nine years and consumed about 13 cigarettes a day. It took an average of nine quit attempts to remain abstinent. See Table 4.2 for participant's smoking history.

Table 4.1. Participant Demographics (N=12)

Age group	
18-21 years old	17%
26-30 years old	41%
31-40 years old	17%
41-50 years old	17%
51-60 years old	8%
Gender	
Male	33%
Female	67%
Ethnicity	
Caucasian	75%
Japanese	8%
Other	17%
Marital status	
Single, never married	84%
Married	8%
Divorced	8%
Highest Level of Education Completed	
High school/GED	16.5%
4-year college degree (BA, BS)	33%
Masters degree	42%
Doctoral degree	8.5%

Table 4.2. Smoking History of Participants

	Mean (SD)
Age of first smoke	15.3 (3.6)
Age at final quit	26.4 (7.1)
Number of years smoked	9.0 (4.7)
Number of cigarettes smoked per day	13.3 (7.9)
Number of quit attempts	9 (11.4)
Methods used to quit	Exercise, keeping cigarettes out of the house, NRT, "cold turkey," gum/candy, mediation, positive affirmations
Final method used to quit	"cold turkey," change of environment, NRT, exercise, food, tapering off of smoking

Key Themes Identified

Motivational factors that influenced quit attempts

When asked why participants wanted to quit, the most common reasons included (1) cost, (2) health, (3) social pressure, and (4) outside influences. Other reasons for wanting to quit smoking included guilt from smoking, cosmetic reasons, inconvenience of smoking, becoming pregnant, wanting to help others quit, and political reasons.

"the cost. It adds up. It's a lot of money. I mean, I mean you don't think about it much on a weekly basis but if you think about 52 weeks. That adds up. Fifty-two weeks. That's a lot of money." (male participant)

"I think the health thing was a reason for me, too…you start noticing after a year, for a while, that your skin gets kind of weird looking. And your teeth. It's harder to keep your teeth white. And.. you smell bad..." (female participant)

"I knew the health reasons just when I started and I knew it smelled when I started. The thing that really kicked me to stop was social pressure." (female participant)

"The best thing that happened for me was when they took (smoking) out of the bars and those places" (female participant)

Motivational factors that influenced the successful quit attempt

Similar answers were found when asked about the main motivational factors that led to the *successful* quit attempt, including: (1) illness or death related to smoking of family members, (2) got to the point of "being sick of it," (3) peer pressure, and (4) change in environment, such as smoke-free laws or going out to bars/parties less. Some other factors mentioned by participants that influenced the final quit attempt were meditation/prayer, pressure from family, health, and cost.

"Ultimately my father who smoked… had a heart attack and that was a big wake-up sign for him as well as me. I can see that kind of thing happening to me further down the road if I continued to treat myself in, ah, such a negative way." (male participant)

"Being just so sick of it. You know? Just done already kind of feeling. Just want to get this over and get on to new things." (female participant)

"I could see the, the use in (the smoke-free laws) even though I was still smoking while some of that stuff was coming out. That actually helped 'cause it's like, wow, the whole community as a whole is coming together and really kind of starting to make a statement, like, 'Hey, this is bad. We don't want this in our air', you know? Second-hand smoke. Things on TV saying about how bad second-hand smoke can be and just bringing those things to light, um, I think it… It definitely does plant a little seed in the mind, in the back of the head." (male participant)

"You can't be what you want to be if you don't quit. And, so, basically, (my husband) was saying, like, You can't be a wife and a mother if you don't quit." (female participant)

"Being…less stressful… before, when I tried to quit I was like applying for school, thinking about moving, ending a…long-term relationship… and all these other things and, um, once all those things were in place it was a lot more easier to quit." (female participant)

Overcoming challenges to quitting

The top challenges that participants faced when trying to quit were (1) managing stress without smoking, (2) social environment/being around others who smoke, (3) managing free time or break time from work, (4) drinking (such as coffee or alcohol) or eating without smoking, (5) see smoking portrayed in movies or media ads or seeing others smoke, and (6) cravings. Other challenges included having friends who did not

take their quit attempts seriously or using smoking as a means to bond with or meet other people.

"Yeah, you just go to a bar or club and you see other people in the bar smoking, laughing, having a good time. You want to, sort of, go back to that time when it felt real good." (male participant)

"I miss standing outside…like having a reason to just go outside and just talk to people. That kind of bonding that you get from smoking." (female participant)

"Seeing someone smoking in a movie or in an anti-smoking ad campaign or talking about it…"(female participant)

"The hardest thing was changing my morning routine. Because, in the morning, I was so accustomed to waking up and making a cup of coffee and smoking a cigarette" (female participant)

Participants shared many reasons how they overcame these challenges. Two means of overcoming these challenges that surfaced with most participants were getting social support and performing "self-talk." Self-talk included telling themselves that smoking did "not really relieve stress," smoking was "not worth the consequences," and overall self-encouragement and positive affirmations. Some other common means for overcoming challenges to quitting smoking included (1) change in social setting, such as not going to bars where smoking was allowed and staying away from friends who smoked, (2) remove temptations, (3) starting to exercise and adopting other healthy behaviors, and (4) time management/planning. Participants also mentioned that seeing others quit smoking, realizing how much time and energy smoking takes, taking up new hobbies (such as cooking and drawing) and "just deal(ing) with it" helped to manage challenges.

"I would put notes in through my house. In the refrigerator, in the closet, in the bathroom, 'Do not smoke today, do not smoke today'." (male participant)

"Ask other people to help you…I generally said things like, 'I don't want to do that anymore. Please don't do it around me'." (female participant)

"I had some support (and) I adopted healthy habits that didn't match up so, like, you know…I wanted to be a runner and smoking would have hurt that" (female participant)

"Positive affirmations and transcendental meditation. Things just to try to calm down and relax..." (male participant)

"I tried not to go out with friends that smoke, and if I did go out with them I made sure that… every time I was with them there was a non-smoking friend. So, when they all leave the club (to smoke) I don't feel like I'm sitting there by myself. I have someone to stay with me and keep me grounded." (female participant)

Maintaining abstinence from smoking

Because almost 60% of smokers relapse (Hymowitz et al., 1997), we explored what factors participants used for maintaining abstinence and preventing relapse. The top factors for staying quit included (1) knowing the feeling of success, (2) support from family and friends, (3) knowing that they are healthier and taking care of themselves, (4) using self-talk, (5) influence of smoke-free policies in bars, restaurants, and the workplace, (5) feeling guilty if they went back to smoking, and (6) changing priorities (such as school or religion). Some other reasons included being able to tell others that they were a non-smoker and seeing the effects on older smokers (such as wrinkles, yellow teeth, smokers cough and voice).

"The guilt is gone…and replaced with a feeling of triumph." (female participant)

"showing myself that I could have control of my own body. Kind of sit in the driver's seat and, um, defeat addiction. That was a, a really liberating feeling…" (male participant)

"I think, once you deeply immerse yourself in whatever you're involved with; religion, studying, school, any of that, it's like, it takes preference over… to a point where you don't even want to smoke anymore." (female participant)

"Oh, it (smoke-free laws) was good. It was good. It's a positive thing. It's very positive, yeah." (male participant)

"(Smoking) seems to bring down everyone's value in a way. Like, it only seems to really bring it up in, like, movies and stuff but then once you realize that your life isn't a movie and a lot of people look down on it...." (female participant)

Advice for current smokers

When asked what advice participants would give to current smokers, the most common answers were (1) get support and ask for help, (2) don't give up, (3) know that

the benefits of quitting smoking outweigh the positives of smoking, (4) have a quit plan, (5) know your triggers, and (6) celebrate milestones. Others advised current smokers to review the image they are putting out to others, take up a new hobby (such as exercise), and put money into savings to see what else you can do with it instead of spending it on cigarettes.

"I would say you have to reach out and ask for social support. You have to ask for help from your family… someone who is important to you. People at work that want you to smoke on break…ask them to help you. And, um, once you get on the right path, stay on it, 'cause it gets better. Once, if you get off, then you gotta, you might have to start all over again." (female participant)

"focusing on.. the baby steps… celebrate…those little steps." (female participant)

"There's gonna be a time in your life when you'll look yourself in the mirror or a certain age you'll get to and you're gonna just regret as hell all the wasted time, money and health you've thrown away due to this nasty habit." (male participant)

Discussion

This study examined what factors motivated ex-smokers to quit smoking using a focus group setting. Motivation has been identified as a key component for successful quitting (McCaul et al., 2006; Osler & Prescott, 1998; Rose et al., 1996), yet there exists a gap as to which motivational factors are necessary to quit and remain abstinent.

Several key themes relating to motivation to quit smoking were identified as a result of the focus group sessions that may have implications for the design of smoking cessation programs for adults (see Table 4.3). Based on our findings, motivational factors that are necessary for successful smoking cessation include the following:

(1) *Highlight factors that predict successful quitting*: Past research has indicated that factors predicting successful quitting differ from factors that predict a quit attempt (Hyland et al, 2006; West et al., 2001). We found, however, that among the study participants many of the factors that led to a quit attempt were similar to those of the successful quit. Consistent with past literature (McCaul et al, 2006), the most common reasons for wanting to quit smoking among participants included cost, health reasons, social pressure, and outside/environmental influences. Similarly, the top factors for increasing

motivation to quit for the *final* time included illness or death related to smoking of family members, got to the point of "being sick of it," peer pressure, and change in environment. Therefore, focusing attention on these factors may increase the motivation of smoker to quit.

(2) *Relative risk perceptions and personal stories*: Although some past research has indicated that smokers tend to be irrationally optimistic about their own personal risk from smoking as compared to other similar smokers (Dillard, et al. 2006; Weinstein & Klein, 1996; Weinstein et al., 2005), participants in this study identified the health of others, especially close family members, as a major motivator for quitting. Hearing personal stories of loved ones getting sick or dying from tobacco-related diseases can possibly increase motivation to want to quit smoking. Our results indicated that the final quit attempt tended to be more personal for the smoker than the previous quit attempts. Therefore, focusing on personal motives for quitting may help increase motivation.

(3) *Increase self-efficacy*: Increasing self-efficacy to quit smoking, commonly defined as "the belief in one's ability to perform the behaviors necessary for a desired outcome" (Bandura, 1997), appeared to be an important element of ex-smokers quitting and staying quit. Many participants reported that "self-talk" and positive affirmations were helpful in improving motivation. Past literature has indicated that motivation to quit is predicted by self-efficacy (Baer, Holt, & Lichtenstein, 1986; Prochaska, Crimi, Lapsanski, Martel, & Reid, 1982; McIntyre, Lichtenstein, & Mermelstein, 1983; O'Hea et al, 2004) and that increasing smoking cessation self-efficacy may be an effective technique to help smokers gain a sense of perceived control over their ability to quit and prevent relapse (Martinez, et al, 2010)

(4) *Social support*: Social support involves encouragement and practical help from other people (May, West, Hajek, McEwen, & McRobbie, 2007). Obtaining social support was one of the most common motivators for the participants in this study. Most social support came from family, friends, and co-workers. Research has shown that having at least one strong supporting relationship is an

important predictor of good health (Michael, Colditz, Coakley, & Kawachi, 1999) and should be encouraged for increasing motivation to quit.

(5) *Develop a quitting plan:* Although studies have reported that most quit-attempts are not planned (Larabie, 2005; West & Sohal, 2006), participants in this study suggested that a quitting plan was helpful for them to successfully quit. Because triggers, such as being around others who smoke, managing stress, drinking alcohol, and eating, were mentioned as a challenge for most participants, we recommend having a plan of action to deal with triggers and specific situations that may pose a challenge to staying quit. Given that it takes multiple quit attempts before successfully abstaining (Larabie, 2005; West et al., 2001), making a plan of action may decrease the number of times it takes to quit for good.

(6) *External factors*: The most common outside influence that motivated smokers to quit included policies that limit second-hand smoke exposure. One of the few studies that investigated how smoke-free policies affect motivation to quit examined how motivation varied across five European countries that differed in their tobacco control policies (Thyrian et al., 2008). Results did not show differing levels of motivation to quit smoking (as measured by the Stages of Change construct) between countries with low, medium, and high tobacco control policies. It was concluded that more longitudinal studies are needed to assess the impact of tobacco control on motivation to quit. We agree that more research is needed in this area. Some focus group participants strongly agreed that smoke-free policies contributed to them quitting and staying quit, while others did not.

Limitations to this study exist. The use of a focus group methodology can be subjective in terms of participant enrollment, participation, and analysis. By conducting several focus groups, this issue was largely accounted for. Several challenges of using retrospective reports exist (McCaul et al., 2006). Ex-smokers may have difficulty recalling what initially motivated them to start changing their behavior. Further, bias may exist in self-reporting, such as giving answers that may be more socially desirable. For

example, McCaul et al. (2006) demonstrated that if someone quit as a result of a spouse nagging them, it may be more socially desirable to say they quit because cigarettes are too expensive. This issue was addressed by reiterating the confidentiality of the focus groups and gaining trust from the participants. Lastly, our aim was to investigate motivational factors of Hawai‘i residents. Unfortunately, we were unable to acquire a representative sample of the Hawai‘i population. For example, our study population included participants with high levels of education and a higher proportion who were Caucasian and single/not married compared to the general population in Hawai‘i. Therefore, our results may be more limited to populations in this sample, and not specifically those in the State of Hawai‘i.

Table 4.3. Principle Findings from Focus Groups

Reasons for quitting tobacco	Cost, health, social pressure, and outside influences
Motivational factors that influenced the final, successful quit attempt	Illness or death related to smoking of family members, got to the point of "being sick of it," peer pressure, and change in environment
Challenges to quitting	Managing stress without smoking, social environment/being around others who smoke, managing free time or break time from work, drinking or eating without smoking, seeing smoking portrayed in movies or media ads or seeing others smoke, and cravings
Motivational factors used to overcome challenges	Change social setting and friends who smoke, remove temptations, starting to exercise and adopting other healthy behaviors, and time management/planning
Maintaining abstinence from smoking	Knowing the feeling of success, support from family and friends, knowing that they are healthier, using self-talk, influence of smoke-free policies in bars, restaurants, and the workplace, feeling guilty if they went back to smoking, and changing priorities
Advice for current smokers	Get support and ask for help, don't give up, benefits of smoking outweigh the positives of smoking, start quitting slow and have a plan, know your triggers, and celebrate milestones.

Conclusion

Motivation is a key element needed for successful cessation from smoking. By using focus groups with former smokers, we were able to identify factors that influenced cessation, investigate how the final quit attempt differed from previous attempts, and explore methods for staying quit. Based on these findings, recommendations for smoking cessation programs to increase motivation were made.

Future research areas include the impact of financial or other incentives for participation in smoking cessation programs and on motivation to quit. Incentives were not brought up by any of the focus group members. The use of a different population, such as those from a workplace or specific smoking cessation program, may yield insight into this. Using different populations of focus group participants warrants increased research to investigate if our findings hold true to other populations and locations.

CHAPTER 5. DISCUSSION AND CONCLUSION

This dissertation investigated means of increasing motivation to quit in smokers who are not ready to quit. Recognizing what motivates smokers to quit is a key element to tailoring smoking cessation strategies to an individual or community. Although there are many studies reporting on the effects of interventions for smokers that are ready to quit, few smoking cessation interventions to reach those with low motivation to quit exists (Prochaska et al., 2008). Therefore, this dissertation aimed to (1) measure the extent to which risk perceptions vary across motivational levels of quitting smoking, (2) test the relationship between smoke-free laws and physician advice to quit smoking with intention to quit in Hawai‘i’s smokers, and (3) assess factors that motivated ex-smokers in Hawai‘i to quit smoking.

Summary of Main Findings

Chapter Two assessed risk perceptions of smokers at different levels of motivation to quit. Our hypotheses were derived from the Health Action Process Approach (HAPA), which states that risk perceptions differentiate “intenders” from “non-intenders” to quit smoking. Using two measures of risk perception and two measures of motivation to quit (the Stages of Change (SOC) and Contemplation Ladder (CL)), the predictions derived from the HAPA were mostly supported. Specifically, low motivation to quit (non-intenders) demonstrated low risk perceptions relative to smokers who were medium or high in motivation to quit (intenders). The general pattern of results were similar for the SOC and CL, although one difference did emerge. For the SOC, the low-high-high contrast (and main effect of SOC) was confirmed for absolute risk, but not for relative risk. For the CL, main effects and the contrasts were significant for both absolute and relative risk.

Further, non-intenders as classified by the CL had lower mean risk perceptions than non-intenders as measured by the SOC. This pattern of results reveals that the quantitative difference between “low” and “high” in the “low-high-high” contrasts is consistently larger for the CL, as compared to the SOC, particularly for relative risk perception. However, the overall direction and trends in the results were similar for the SOC and CL.

The overall results demonstrated that risk perception does distinguish non-intenders from intenders. However, these cross-sectional results do not demonstrate the causal direction of this relationship. Further, although the results reveal differences in risk perception across levels of motivation to quit, risk perceptions still were substantial even among non-intenders.

Chapter Three used data from the 2006 Hawai‘i Adult Tobacco Survey to explore the extent to which the Hawai‘i smoke-free laws are perceived differently across different motivation levels of quitting smoking and the extent to which those at varying levels of motivation received physician advice to quit smoking.

Results indicated that smokers with lower motivation to quit received less physician recommendations for using nicotine replacement therapy (NRT) compared to smokers with higher motivation to quit. Similarly, smokers with lower motivation to quit received less advice to set a quit date and were given less materials on quitting smoking from their physician compared to those with higher motivation to quit. This indicates that it does make a difference at which motivational level a smoker is at for a physician to recommend the use of NRT, give advice on setting a quit date, and provide patient with materials for quitting smoking. A possible explanation for this is that physicians may tailor their advice and give action-oriented messages only to smokers who are ready to quit. In addition, smokers who are motivated to quit may be more inclined to ask their physicians for NRT or smoking cessation materials than smokers who are not motivated to quit.

Results showed that it does not make a difference at which motivational level a smoker is at for seeing a physician or receiving advice not to smoke. A significant difference was seen between motivation levels for a physician providing quit smoking materials, recommending NRT, recommending setting a quit date, and having a physician suggest using a smoking cessation class, program, quit line, or counseling. Therefore, smokers with lower motivation to quit receive physician involvement with less consistency than smokers with higher motivation. This is possibly due to physicians having less confidence in how to address smokers who are not ready to quit (Kottke et al., 1990; Ockene & Ockene, 1996).

Differences in motivation level of smokers when addressing smoke-free laws were found. We were only able to partially support past literature that smokers with lower motivation to quit have less agreement with smoke-free laws than smokers who are more motivated to quit (Crospey & Kristeller, 2003). For example, with an increase in motivation level, a decrease in perceptions that smoking should be "allowed in all areas" of the beach and airport was seen. However, smokers with higher motivation reported the lowest percentage of agreeing that smoking should not be allowed at all at the beach. This discrepancy indicates that phrasing of questions may have an impact on responses. Results showed that motivational level did not significantly matter for perceptions of smoking at a bar/night club, at entrances to buildings, or at restaurants, which does not support our hypothesis or past research (Frieden et al., 2005; Hammond et al., 2004; Hopkins et al., 2010). This may possibly be due to the fact that some restaurants and bars have outside eating or drinking areas where smoking is still allowed.

Relationships between physician involvement in motivating patients to quit smoking and smoke-free law perceptions were not found to be significant. This may indicate that using these two variables together do not make for a stronger intervention. The one relationship that did stand out, however, was between smoker's perceptions of whether smoking should be allowed at the airport and physician involvement in advising smokers to not smoke for all smokers and for smokers with low motivation to quit. A probable explanation for this is that smokers may associate smoking in airport as more negative than smoking in other places.

We were not able to support our hypothesis that physician involvement and smoke-free laws combined predicted an increase in motivation of smokers to quit compared to either strategy alone. Further, perceptions of smoke-free laws alone did not predict motivation level. We did, however, find that physician involvement in motivating patients to quit smoking was related to the level of motivation to quit smoking.

In order to further examine factors that motivate smokers to quit, Chapter Four utilized focus groups of ex-smokers to explore motivational factors for quitting smoking. Several key themes relating to motivation to quit smoking were identified as a result of the focus group sessions that may have implications for the design of smoking cessation

programs for adults. Based on our findings, we hypothesize that motivational factors necessary for successful smoking cessation include the following: (1) highlight factors that predict successful quitting, (2) identify relative risk perceptions and personal stories, (3) increase self-efficacy, (4) obtain social support, (5) develop a quitting plan, and (6) identify external factors that influence motivation.

Recommendations for Increasing Motivation to Quit

Based on the main findings described above, the following recommendations for increasing motivation in smokers to quit include:

(1) Smokers low in motivation to quit can benefit from information and reminders about the serious health problems caused by smoking. Highlighting both the absolute and relative risk of acquiring a smoking-related disease should also be emphasized. Risk perceptions are important for understanding the process of smoking cessation because health concerns are the main reason motivating smokers to quit (McCaul et al. 2006). In addition, research has shown that smokers are irrationally optimistic about their own personal risks as compared to other smokers with similar demographic characteristics and smoking histories (Dillard, et al. 2006; Weinstein & Klein, 1996; Weinstein et al., 2005).

(2) Physicians should be involved in the quitting process with smokers of all different levels of motivation to quit. As indicated from Chapter Three, physicians may want to offer nicotine replacement therapy, advice on setting a quit date, and provide materials for quitting smoking to all patients that smoke. Past research has indicated that physician involvement has been recognized as a variable for increasing motivation to quit smoking (Eckert & Junker, 2001; Kottke et al., 1988; Lancaster et al., 2000).

(3) Implement smoke-free laws in public areas, especially at beaches and airports as seen in Chapter Three, may increase motivation in some smokers. Past literature supports smoke-free laws for increasing motivation (Frieden et al., 2005; Hammond et al., 2004; Hopkins et al., 2010).

(4) Format the quitting process to be personal. Hearing personal stories of loved ones getting sick or dying from tobacco-related diseases can possibly increase

motivation to want to quit smoking. Results from Chapter Four indicated that the final quit attempt tended to be triggered by more personal factors for the smoker than the previous quit attempts.

(5) Develop a quitting plan to deal with triggers. Triggers, such as being around others who smoke, managing stress, drinking alcohol, or eating, are often challenging to quitting and maintaining abstinence. Therefore, we suggest having a plan of action to deal with triggers and specific situations that may pose a challenge to staying quit. Given that it takes multiple quit attempts before successfully abstaining (Larabie, 2005; West et al., 2001), making a plan of action may decrease the number of times it takes to quit for good.

(6) Obtain social support before, during, and after the quitting process. Social support involves encouragement and practical help from other people (May et al., 2007). Research has shown that having at least one strong supporting relationship is an important predictor of good health (Michael et al., 1999) and should be encouraged for increasing motivation to quit.

(7) Increase self-efficacy to quit and stay quit. Increasing self-efficacy to quit smoking, commonly defined as the belief in one's ability to perform the behaviors necessary for a desired outcome (Bandura, 1997), appeared to be an important element of ex-smokers quitting and staying quit. Many participants reported that "self-talk" and positive affirmations were helpful in improving motivation. Past literature has indicated that motivation to quit is predicted by self-efficacy (Baer et al., 1986; Prochaska et al., 1982; McIntyre et al., 1983; O'Hea et al., 2004) and that increasing smoking cessation self-efficacy may be an effective technique to help smokers gain a sense of perceived control over their ability to quit and prevent relapse (Martinez, et al, 2010)

(8) Highlight factors that predict successful quitting. Past research has indicated that factors predicting successful quitting differ from factors that predict a quit attempt (Hyland, et al, 2006; West, et al., 2001). Consistent with past literature (McCaul, et al, 2006), Chapter Four indicated that the most common reasons for wanting to quit smoking included cost, health reasons, social pressure, and

outside/environmental influences. Similarly, the top factors for increasing motivation to quit for the *final* time included illness or death related to smoking of family members, got to the point of "being sick of it," peer pressure, and change in environment (such as enactment of smoke-free laws or moving to where peers do not smoke).

Future Research

Results from all three studies indicated the need for additional research in how to motivate smokers to quit. The following are recommendations for future research:

(1) Focus on how messages regarding health risks can be incorporated into interventions targeted at smokers who do not intend to quit.
(2) Explore further how smoke-free laws and physician involvement in the quitting process correlate with each other.
(3) Explore the extent to which smoke-free policies contribute to smokers quitting and staying quit.
(4) Research combining social and environmental factors of quitting smoking to understand and capitalize on the potential synergy.
(5) Study the impact of financial or other incentives for participation in smoking cessation programs and on motivation to quit.

Conclusion

For over 50 years it has been known that tobacco leads to increased morbidity and mortality in humans (Fiore & Baker, 2009). Despite these concrete findings, about 21% of adults in the US (CDC, 2009) and about 15% of adults in Hawai‘i still smoke (Pobutsky & Lowery St. John, 2010). Increasing motivation in smokers to quit is a key element needed to tailor intervention programs that work towards increasing cessation rates. Although there are many studies reporting on the effects of interventions for smokers that are ready to quit, there exists few evidence-based smoking cessation interventions to reach those with low motivation to quit exists (Prochaska et al., 2008). Research into this area is essential because some data show that motivation to quit predicts actual quitting (Marlatt et al., 1988).

Research has indicated that although smokers are aware of the negative health effects from smoking, it remains unknown whether these smokers have lower perceptions of risk. Recognizing the health risks of smoking should make a smoker want to quit. Smokers with medium and high motivation to quit both want and intend to quit. However, smokers with low motivation to quit either do not sufficiently recognize these health risks, or they minimize the risk in order to justify continuing smoking. Therefore, identifying how those with varying levels of motivation view risk of smoking can lead to developing appropriate interventions to increase motivation to quit.

Similarly, physician advice to quit smoking and smoke-free laws has been linked to increasing motivation to quit among smokers. There are few studies investigating how these motivators are viewed by those unmotivated to quit smoking. Preliminary findings from this dissertation show that motivators of smoking cessation are viewed differently among those with different levels of motivation, although further research is needed to verify these results. Both motivators are vital for increasing cessation rates. Therefore, it is necessary to determine if both of these factors are important to implement together as part of an intervention for increasing motivation to quit.

Using advice and perceptions from ex-smokers about what motivated them to quit is essential in understanding the quitting process. Although many recommendations have been made by researchers, much can be learned from the advice of someone who has been through the quitting process.

In summary, in order to be able to assist smokers in quitting and decrease the morbidity and mortality associated with tobacco use, researchers need to continue to identify what factors lead to increased motivation to quit and develop interventions based on these findings. The concept of motivation is important because smoking cessation interventions will not be successful for smokers who are unmotivated to quit.

APPENDIX A. FOCUS GROUP QUESTIONNAIRE

1. What is your age:
    - 18-21
    - 22-25
    - 26-30
    - 31-40
    - 41-50
    - 51-60
    - 61+
2. What is your gender:
    - Male
    - Female
3. What ethnicity do you *most* identify with:
    - Caucasian
    - Native Hawaiian
    - Chinese
    - Philipino
    - Japanese
    - Other
4. What is your marital status:
    - Single, never married
    - Married
    - Separated
    - Divorced
    - Widowed
5. What is the highest level of education you completed:
    - Less than high school
    - High schools/GED
    - Some college

- 2-year college degree (associates)
- 4-year college degree (BA, BS)
- Masters Degree
- Doctoral Degree
- Professional Degree (MD, JD)

6. What age did you first start smoking? _____
7. What age did you stop smoking for good? _____
8. How many years total did you smoke for? _____
9. What is the average number of cigarettes you smoked per day?_____
10. What was your preferred brand of cigarettes?_____
11. Who else in your household *used to* smoke? At what age did this person(s) quit for good? _____
12. Who in your household currently smokes? How old is this person(s)?_____
13. How many times did you try to quit smoking before you were successful?_____
14. What method(s) did you try to use to quit smoking?_____
15. What method(s) was finally successful for you in quitting smoking?_____

APPENDIX B. FOCUS GROUP INFORMED CONSENT

Rebecca Williams, M.P.H., a student at the University of Hawai‘i in the Department of Public Health, invites you to be part of a research project that she will conduct in order to complete requirements for an advanced degree. She is supervised by Dr. Claudio Nigg, Ph.D. The project looks at the motivating factors that led ex-smokers to successfully quit smoking. The purpose of this study is to better understand what motivational factors are important for focusing cessation programs and interventions on.

If you agree to be part of the research study, you will be asked to participate in one focus group session at the University of Hawai‘i, Mānoa campus or community location. We will ask people to meet together to discuss their personal motivations for successfully quitting smoking. A member of the research team will help guide the discussion. The focus group will last about 90 minutes and we will audiotaped to make sure that it is recorded accurately. You must agree to be audiotaped to participate in the focus group.

Answering questions or talking about personal information can be difficult. You may choose not to answer any discussion question and you can stop your participation in the focus group at any time. The interviewer will have a list of local agencies that can provide you with additional information or support if you are interested.

While unlikely, there is a chance that another member of the focus group could reveal something about you that they learned in the discussion. All focus group members are asked to respect the privacy of other group members. You may tell others that you were in a focus group and the general topic of the discussion, but actual names and stories of other participants should not be repeated.

You will receive a $20 gift card and $5 for parking for participating in the entire focus group session. You will need to pay for your own travel.

We plan to publish the results of this study, but will not include any information that would identify you or. To keep your information safe, the audiotape and any notes taken during the discussion will be placed in a locked file cabinet. The researcher will enter

study data on a computer that is password-protected. To protect confidentiality, your real name will not be used in the written copy of the discussion.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to answer a focus group question for any reason.

If you have questions about this research you can contact Rebecca Williams, M.P.H. Department of Public Health Sciences, John A. Burns School of Medicine University of Hawai‘i at Mānoa 1960 East-West Road Honolulu, HI 96822, Tel: (808) 956-5764 Email: rjwillia@Hawai‘i.edu. You can also contact her faculty advisor, Claudio R. Nigg, Ph.D. Department of Public Health Sciences, John A. Burns School of Medicine University of Hawai‘i at Mānoa1960 East-West Road Honolulu, HI 96822, Tel: (808) 956-2862 Email: cnigg@Hawai‘i.edu. Additionally, you may contact the University of Hawai‘i Committee on Human Studies department anonymously at 808-956-5007.

By signing this document, you are agreeing to be in the study. You will be given a copy of this document for your records and one copy will be kept with the study records. Be sure that questions you have about the study have been answered and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

I agree to participate in the study. As part of my consent, I agree to be audiotaped.

Please check one:

Yes_____

No_____

APPENDIX C. FOCUS GROUP GUIDE QUESTIONS

Question 1: What were some of your reasons for using tobacco?

Question 2: Why did you quit smoking?

Probe: What were some other important factors that influenced your final quit attempt?

Probe: How many times did you try to quit?

Probe: Now think of this last time, what made it different from other times you tried to quit?

Question 3: What challenges did you face when trying to quit?

Probe: How did you overcome these challenges?

Question 4: How did you stay quit?

Probe: What was different this last time compared to past quit attempts?

Question 5: What advice have you given others over the years about successfully quitting smoking?

Question 6: Did you receive doctor's advice/counseling/help to quit smoking? Go to class? Receive quit smoking materials? Receive nicotine replacement therapy?

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