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Predicting use of assistance when quitting: A longitudinal study of the role of quitting beliefs

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ABSTRACT

Background: A growing literature addresses the need to reduce cigarette smoking prevalence by increasing the use of assistance when quitting. A key focus is to identify strategies for enhancing adoption of effective interventions in order to increase utilization of evidence-based treatments.
Purpose: To examine the effect of beliefs regarding ability to quit on utilization of assistance for smoking cessation. A mediation model was hypothesized whereby the relationship between smoking and use of assistance is influenced by beliefs in ability to quit.
Methods: The present study includes 474 of 1000 respondents to baseline and follow-up California Smokers Cohort surveys conducted from 2011 to 2013. Included were baseline smokers who reported a 24-h quit attempt at follow-up. Baseline variables were used to predict use of assistance when quitting.
Results: The hypothesized model was tested using a product of coefficients method, controlling for demographics. Greater heaviness of smoking and lower belief in ability to quit were significantly related to use of assistance. Quitting beliefs significantly mediated the relationship between nicotine dependence and use of assistance.
Conclusions: The present data support a mechanism whereby the effect of smoking rate on treatment utilization is mediated by beliefs in ability to quit. Greater belief in one's ability to quit may represent an obstacle to treatment utilization by reducing the likelihood of successful cessation. The present findings suggest the value of targeted messages from health care providers that normalize the need for assistance when attempting to change an addictive behavior and emphasize the difficulty of quitting without assistance.

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1. Introduction

1.1. Smoking cessation treatment utilization

A growing literature addresses the need to reduce cigarette smoking prevalence by increasing the use of assistance when attempting to quit (Abrams et al., 2010; Backinger et al., 2010; Orleans et al., 2010). A key focus is to identify strategies for enhancing adoption of effective interventions in order to increase the proportion of quitters who employ evidence-based treatments during cessation attempts. Assisted quitting refers to utilization of evidence-based strategies such as medication or behavioral counseling (Fiore et al., 2008; Kotz et al., 2009) when trying to quit smoking. Studies addressing treatment utilization indicate that the majority of quit attempts are unassisted, with a small minority employing behavioral and pharmaceutical assistance simultaneously (Edwards et al., 2014; Shiffman et al., 2008a; Zhu et al., 2000). Unassisted quitting, where the smoker does not employ any evidence-based treatment, is thus the norm, despite better cessation outcomes when using smoking cessation assistance (Fiore et al., 2008; Mottillo et al., 2009; Piper et al., 2009). Highlighting the potential value of assisted quitting, a recent observational study found that smokers in England who used both pharmaceutical and behavioral assistance had significantly better outcomes than those who did not use any assistance or used only one form of treatment (Kotz et al., 2014). This finding is consonant with current clinical treatment guidelines (Fiore et al., 2008) and

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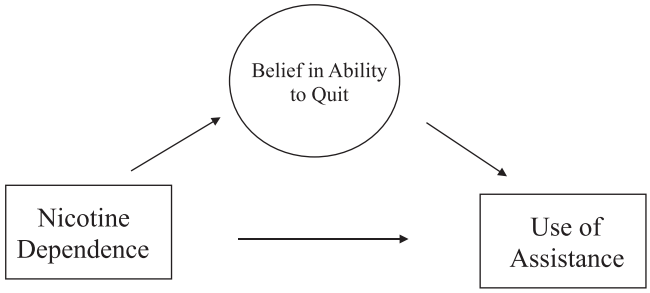

Fig. 1. Hypothesized mediating model for relationship of nicotine dependence with use of assistance during a quit attempt.

prior evidence for improved outcomes when treatment involves a combination of medication and behavioral counseling (Stead and Lancaster, 2012a,b).

1.2. Characteristics of smokers using assistance

At this time, little is known regarding smoker characteristics associated with the use of assistance when attempting to quit smoking. Such knowledge may serve to guide strategies for increasing smoking cessation treatment utilization. Relatively consistent findings emerge indicating that use of assistance is associated with higher levels of dependence, female sex, increasing age and White ethnicity (Kotz et al., 2009; Shiffman et al., 2008b; Zhu et al., 2000). In addition, cognitions and beliefs have been found related with treatment utilization. Lack of accurate knowledge regarding the effectiveness for various forms of treatment has been identified as a barrier in studies of attitudes toward using assistance (Carpenter et al., 2011; Foulds et al., 2009; Narayanan et al., 2009; Vogt et al., 2010). For example, beliefs that nicotine replacement medications (NRT) may be harmful, and overestimates of ability to quit successfully without assistance have been cited as reasons smokers may not utilize medications for quitting (Foulds et al., 2009). On the other hand, use of assistance has been found to be associated with lower self-efficacy for quitting and positive beliefs regarding the usefulness of treatment (Weber et al., 2007). However, beliefs as barriers to treatment have been examined only in relation to attitudes toward assistance (e.g., self-reported likelihood of utilizing assistance) rather than with actual behaviors.

1.3. Present study

Despite the acknowledged importance of this issue, no longitudinal studies predicting use of assistance during smoking cessation attempts were identified. To address this issue, the present study examined baseline predictors of utilizing assistance in a subsequent smoking cessation attempt in a sample of California smokers. Based on evidence from cross-sectional research, it was hypothesized that, after accounting for demographic variables, more heavily dependent smokers would be more likely to utilize assistance. Based on findings regarding influences on attitudes toward treatment (Foulds et al., 2009; Weber et al., 2007) it was also predicted that beliefs regarding one's ability to quit would mediate the relationship between heaviness of smoking and use of assistance (see Fig. 1). Specifically, it was hypothesized that the relationship between heavy smoking and increased utilization reflects lower belief in ability to quit.

2. Materials and methods

2.1. Sample

The data for the present study are from the California Smokers Cohort (CSC) conducted from 2011 to 2013. The CSC was a population-based survey of a sample of adults in California who reported smoking 100 cigarettes in their lifetime. The study included a baseline survey (conducted from July, 2011 to April, 2012) to establish a cohort of current and former smokers, and a follow-up survey (conducted from November, 2012 to January, 2013) to examine changes in smoking behaviors. The sample was identified through a random-digit-dial (RDD) survey of California households to screen for tobacco use; respondents who had smoked at least 100 cigarettes in their lifetime were administered the baseline survey ($n = 4350$). Of the 1745 eligible smokers and former smokers from the CSC baseline survey cohort who also completed a follow-up survey, 1000 adults were smokers at baseline. Analyses in the current study included 474 of the 1000 respondents who completed both the baseline and follow-up surveys and reported a 24-h quit attempt during the prior year at the follow-up survey. Interviews were conducted in both English and Spanish over landline and cellular telephones. Survey procedures were approved by the University of California, San Diego Human Research Protection Program. Participants provided free and informed consent for their participation.

2.2. Survey items

2.2.1. Baseline predictors.

2.2.1.1. Quit attempt. Included in the present sample were respondents who at follow-up reported quitting smoking intentionally for one day or longer in the past year. The 24-h duration is commonly used in the literature to define a quit attempt (USDHS, 1999) and was employed here to denote an intentional effort to stop smoking.

2.2.1.2. The Heavy Smoking Index (HSI; Heatherton et al., 1989). The Heavy Smoking Index (*HSI*; Heatherton et al., 1989) was used to represent nicotine dependence. The index is composed of two items, number of cigarettes per day and time to first cigarette, each scored from 0 to 3 based on the Fagerstrom Test for Nicotine Dependence criteria (Heatherton et al., 1991). The HSI is found to have high concordance with the Fagerstom Test for Nicotine Dependence (Chabrol et al., 2005) and is considered a good brief screen for high nicotine dependence (Perez-Rios et al., 2009).

2.2.1.3. Quitting attitudes/belief variables. Four items representing beliefs regarding ability to quit smoking, behavioral and addiction impediments to quitting, and belief in ability to quit without pharmaceuticals were selected from the survey based on content reflecting an aspect of beliefs in quitting. Each item was scored as a dichotomy reflecting more belief in one's ability to quit. The first item was a standard self-efficacy question: "How sure are you that you [could/can] refrain from smoking for at least [one/one more] month?" This item had 4 response items (very sure, somewhat sure, somewhat unsure, very unsure). Responses were dichotomized to conform to the scaling of other belief items (very sure/somewhat sure = 1; somewhat unsure/unsure = 0).

The second item was drawn from a set of 6 questions designed to assess smokers beliefs regarding NRT's: "Smokers can quit on their own without any pharmaceutical aids." This item presented two options and was scored as 'agree' = 1 or 'disagree' = 0. The final 2 items were drawn from a scale examining perceived reasons for why respondents are still smoking and were scored 'yes' = 0 or 'no' = 1: "You're still smoking because: Your cravings for cigarettes are too strong." ". . .It has become a routine that would be really hard for you to break." These items were selected to represent difficulty quitting attributed to physical and psychological addiction.

A nonparametric item response model (Ramsay, 1991) was employed to evaluate the assumption that the probability of higher scores increased along with greater belief in ability to quit. Option characteristic curves suggested that when item scores were dichotomized the probability of endorsing each item grew consistently with increasing levels of total beliefs. Point-biserial item-total correlations ranged from 0.53 to 0.71 and supported the strength of each items' association with a common construct. With support for the construct validity and adequate reliability for this brief scale these four items were summed into a quitting beliefs scale, with higher scores reflecting greater belief in one's ability to quit.

2.2.2. Baseline covariates. Gender, ethnicity, age, and education were employed as demographic control variables given evidence in prior studies for differences in utilization rates. Because of the small sample size ethnicity was dichotomized to reflect non-Hispanic White in one category and Hispanic plus other non-White ethnic groups in the other. Age and education were each recoded into three categories (respectively: 18–24, 25–44, 45 and older; high school or less, some college and college; and postgraduate).

2.2.3. Dependent variable. A composite variable was created to indicate use of any type of assistance during the follow-up quit attempt. The assistance items were asked for their most recent quit attempt. Respondents were coded as having used assistance in their most recent quit attempt if they responded "yes" to any of the following 3 items: