



Predictors of successful and unsuccessful quit attempts among smokers motivated to quit



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HIGHLIGHTS

- Many smokers do not attempt to quit or relapse soon after their quit attempt.
- We investigated the predictors of successful and unsuccessful quit attempts.
- Different factors played a role in predicting quit attempts and their success.
- Intention to quit only played a role in predicting quit attempts.
- Self-efficacy was the main factor predicting quit attempt success.

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ABSTRACT

Introduction: Despite their positive motivation to quit, many smokers do not attempt to quit or relapse soon after their quit attempt. This study investigated the predictors of successful and unsuccessful quit attempts among smokers motivated to quit smoking.

Methods: We conducted secondary data analysis among respondents motivated to quit within 6 months, randomized to the control group ($N = 570$) of a Web-based smoking cessation intervention study. Using chi-square tests and ANOVA with Tukey post hoc comparisons, we investigated baseline differences by smoking status (successful quitter/relapse/persistent smoker) assessed after 6 weeks ($N = 214$). To identify independent predictors of smoking status, multivariate multinomial logistic regression analyses were conducted.

Results: Successful quitters at 6-week follow-up (26%) had reported significantly higher baseline levels of self-efficacy than relapsers (45%) and persistent smokers (29%). Furthermore, both successful quitters and relapsers had reported a significantly higher baseline intention to quit than persistent smokers and successful quitters had reported significantly more preparatory planning at baseline than persistent smokers. Results from regression analyses showed that smokers' baseline intention to quit positively predicted quit attempts reported after 6 weeks, while self-efficacy positively predicted quit attempt success.

Conclusions: Different factors appear to play a role in predicting quit attempts and their success. Whereas intention to quit only appeared to play a role in predicting quit attempts, self-efficacy was the main factor predicting quit attempt success. More research is needed to determine the role of preparatory planning and plan enactment and to investigate whether these findings can be replicated on the long term.

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1. Introduction

Effective interventions exist to aid smokers in the process of smoking cessation (Lancaster & Stead, 2005, 2008; Lancaster, Stead,

Silagy, & Sowden, 2000). These interventions mostly target smokers motivated to quit, as a positive motivation to quit is considered a necessary prerequisite for smokers to actually quit smoking (Hyland et al., 2006; Norman, Conner, & Bell, 1999; Vangeli, Stapleton, Smit, Borland, & West, 2011). This is not surprising as, next to intervention developers, smokers themselves also believe that it is necessary to be motivated to quit smoking before it is worthwhile trying (Balmford & Borland, 2008). Despite using the motivation to quit as an inclusion criterion, however, smoking cessation intervention studies still show that many

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smokers do not make a quit attempt during the study period, or do make a quit attempt but relapse to smoking soon after their attempt (Hoving, Mudde, Dijk, & de Vries, 2010; Smit, De Vries, & Hoving, 2012; Te Poel, Bolman, Reubsat, & de Vries, 2009). It is therefore important to not only identify the predictors of undertaking a quit attempt, but also to investigate the predictors of quit attempt success among smokers participating in smoking cessation intervention studies.

A systematic review investigating the predictors of attempts to quit smoking and their success found that having made a quit attempt in the past year and motivation to quit were highly predictive of quit attempts whereas only measures of tobacco dependence were consistently predictive of the success of these attempts (Vangeli et al., 2011). Similarly, a study among Canadian young adults found that intention to quit predicted quit attempts, whereas low addiction levels and high self-efficacy levels predicted 30-day smoking abstinence (Diemert, Bondy, Brown, & Manske, 2013). In other previous studies, self-efficacy has also been found to be an important predictor of quit attempts' success (Gwaltney, Metrik, Kahler, & Shiffman, 2009; Ockene et al., 2000; Vangeli et al., 2011). Most of these studies, however, only included respondents from general population samples of smokers. Though, for intervention developers, it might be most informative to know whether these results are generalizable to samples of smokers who voluntarily participate in smoking cessation intervention studies and can be expected to have at least some motivation to quit smoking. Some studies conducted among smokers participating in smoking cessation intervention studies identified lower nicotine dependence (Bailey, Bryson, & Killen, 2011) as a predictor of quit attempts, and gender (Bailey et al., 2011), higher self-efficacy levels (Elfeddali, Bolman, Candel, Wiers, & de Vries, 2012b), the use of bupropion (Hoving, Mudde, & de Vries, 2006) and preparatory planning (Elfeddali et al., 2012b; Hoving et al., 2006) as predictors of smoking abstinence.

Yet, as the evidence to date on the predictors of quit attempts and their success among smokers motivated to quit is ambiguous, the present study aimed to identify the predictors of successful and unsuccessful quit attempts assessed after a 6-week follow-up period among smokers motivated to quit within 6 months. In this study, we used the Integrated Change (I-Change) Model (De Vries et al., 2003; Fig. 1) as a theoretical framework. According to the I-Change Model (De Vries et al., 2003), the most proximal predictor of behavior is the intention to perform this behavior, which is predicted by three motivational constructs: attitude, consisting of the perceived advantages (pros) and disadvantages (cons) of the behavior; perceived social influence, including perceived social norms, social modeling and social pressure; and self-efficacy, or a person's level of confidence to perform the behavior. The I-Change Model (De Vries et al., 2003) also includes several pre-motivational and post-motivational factors and it recognizes the gap between intention and behavior (e.g. (Armitage & Conner, 2001)). While perceived barriers to change might increase this intention-behavior gap, ability factors as skills and the formation of action plans (including both preparatory planning and coping planning) are assumed to bridge this gap. Based on the I-Change Model and previous research findings, we hypothesized that cognitive factors such as attitude, social influence, self-efficacy and the intention to quit smoking would predict initial behavior change, or attempts to quit smoking, and that ability factors such as action planning, (perceived) skills and barriers (e.g. the level of nicotine dependence), would predict the success of these attempts.

2. Methods

Secondary analyses were conducted among respondents in the no-intervention control group ($N = 570$) of a randomized controlled trial (RCT) investigating the effectiveness of a Web-based computer-tailored smoking cessation program.

2.1. Participants

The RCT was approved by the Medical Ethics Committee of Maastricht University and the University Hospital Maastricht (MEC 08-3-037; NL22692.068.08), and is registered with the Dutch Trial Register (NTR1351). Dutch adult smokers were recruited from December 2009 until June 2010 by advertising the RCT in the mass media and on the Internet. Several press releases were sent to regional Dutch newspapers, most of which advertised our study on their Web site, published an item about the study in the written edition of their newspaper, or mentioned the study on their local radio and/or television channel. In addition, we advertised our study on a Dutch online social network Web site (Hyves) and on multiple online smoking cessation forums, and published an advertisement in a free national newspaper. Interested smokers could sign up for the study on the study Web site and were eligible to participate when they were 18 years or older, were motivated to quit smoking within 6 months and had access to the Internet. As we aimed to recruit regular smokers, potential respondents were excluded from participation when they indicated to not have smoked in the past 7 days. On the study Web site, participants were informed that the Dutch Cancer Society financially supported the study and that the study was conducted by researchers from Maastricht University in collaboration with the Dutch Expert Center on Tobacco Control (STIVORO). Besides, the Web site consisted of information on study objectives, the randomization procedure and the incentive (i.e. a €10 gift voucher) respondents would obtain when completing all questionnaires. After providing online informed consent, participants were randomized into the intervention group or the no-intervention control group using a computer software randomization device, allocating approximately 50% of respondents to either group. Full details about the RCT can be found elsewhere (Smit et al., 2012).

2.2. Measurements

All measures used in the present study were based on the I-Change Model (De Vries et al., 2003) and have previously been used successfully to understand and change smoking behavior (Elfeddali, Bolman, Candel, Wiers, & de Vries, 2012a; Hoving et al., 2010; Te Poel et al., 2009).

2.3. Baseline measurement

2.3.1. Pre-motivational factors

Three demographic variables were measured: age in years, gender and educational level.

Behavioural variables assessed were addiction level and the number of previous quit attempts. Addiction level was measured by the abbreviated Fagerström Test for Cigarette Dependence (FTCD) (0 = not addicted; 10 = highly addicted) (Fagerstrom, 2012; Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). The number of previous quit attempts was assessed with one item, asking the respondents how often they had tried to quit smoking in the past.

2.3.2. Motivational factors

Attitude toward quitting was assessed by measuring the advantages (pros) and disadvantages (cons) of quitting. The pros of quitting were measured by six items (Cronbach's $\alpha = .71$), measured on a 5-point Likert scale (e.g. When I do not smoke, my health will improve; 1 = no, does not improve; 2 = do not know; 3 = yes, will improve a bit; 4 = yes, will improve; 5 = yes, will improve a lot). The cons of quitting were also assessed by six items (Cronbach's $\alpha = .69$), measured on a 5-point Likert scale (e.g. When I do not smoke, I will gain weight; 1 = no, I will not gain weight; 2 = do not know; 3 = yes, I will gain a little weight; 4 = yes, I will gain weight; 5 = yes, I will gain a lot of weight). For both the pros and cons of quitting, a sum score was calculated to be included in further analyses.

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