Published in final edited form as:

Addict Behav. 2013 June ; 38(6): 2257–2260. doi:10.1016/j.addbeh.2013.02.008.

Characteristics of Cigarette Smokers Who Want to Quit Now versus Quit Later

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Abstract

This study evaluated factors associated with adult smokers' immediate readiness to quit. Eligible smokers were proactively recruited online and invited to participate in either a telephone-based study for those who intend to quit in the next 30 days (Quit Now) or a telephone-based study for those who intend to quit, but not in the next month (Quit Later). Thirty-five percent of smokers declined participation altogether. Of those who remained, 25% chose Quit Now participation. Baseline data were collected via mail questionnaire and telephone interview. Quit Now and Quit Later participants (N=1132) differed on demographic, smoking history, and psychological variables. Independent predictors of Quit Now group membership included younger age, stronger intention to quit in next six months, greater self-efficacy to cope with temptation to smoke, and more support from significant others related to quit attempts—much of which is modifiable. Understanding factors that predict smokers' immediate readiness to quit (measured here as Quit Now group membership) could contribute to development of smoking cessation treatments tailored for smokers who are seemingly not yet ready to quit.

Keywords

clinical trial enrollment; readiness to change; smoking; smoking cessation; quit attempts

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Contributors

MJC designed the study and supervised all aspects of the protocol. MJC and JLB formulated the research question, hypotheses, and data analytic plan. JLB and AEW conducted the data analysis. JLB took lead role in writing and editing the manuscript while MJC and AEW provided constructive feedback. All authors contributed to and approved the final manuscript.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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1. Introduction

The current prevalence of cigarette smoking among United States adults aged 18 and older is 20% (CDC, 2011a). Most smokers are interested in smoking cessation (CDC, 2011b) and have made multiple quit attempts in the past (CDC, 2011b; Fiore et al., 2008). However, the majority of smokers do not make a quit attempt in any given year (CDC, 2011b; Shiffman, Brockwell, Pillitteri, & Gitchell, 2008) and most quit attempts end in relapse (Fiore et al., 2008). Successful smoking cessation is more likely if smokers utilize evidence-based smoking cessation treatments (Fiore et al., 2008; Zhu, Melcer, Sun, Rosbrook, & Pierce, 2000). Unfortunately, smoking cessation treatment use is modest, with less than one-third of smokers using practical counseling and/or pharmacological aids (CDC, 2011b; Shiffman et al., 2008; Zhu et al., 2000). In sum, there is strong need to understand what factors predict smokers' immediate readiness to quit as well as their use of smoking cessation treatments.

Prior studies of who will and will not engage in smoking cessation often rely on data from randomized clinical trials (RCTs) of smoking cessation treatments (Audrain-McGovern, Halbert, Rodriguez, Epstein, & Tercyak, 2007; Graham et al., 2008; King, Cao, Southard, & Matthews, 2011; Troyer, Ferketick, Murray, Paskett, & Wewers, 2011; Woods et al., 2002). The study of differences between participants and non-participants of RCTs is worthwhile, since participation is a real-world indicator of smokers' readiness to quit. However, this research has its limitations. First, it typically identifies variables that predict participation in RCTs that are designed for smokers who "treatment seeking" and/or ready to quit immediately. Since most smokers do not fall within this category (Wewers, Stillman, Hartman, & Shopland, 2003), the pool of potential participants for most RCTs is quite small, which limits the generalizability of study results. Second, smokers who decline participation may do so for study specific reasons (e.g., treatment format and duration) and not intrapersonal reasons (e.g., self-efficacy about abstinence). If this is the case, then participation or the lack thereof may be unrelated to the underlying construct of interest, namely readiness to quit.

The purpose of the current study was to understand smokers who chose participation in a study for those who intend to quit in the next 30 days (Quit Now) versus a study for those who intend to quit, but not in the next month (Quit Later). This evaluation of smokers' participation in a RCT differs from previous research in three important ways: 1) proactive recruitment allowed enrollment of a wide range of smokers, 2) participation was open to smokers across the continuum of readiness to quit, and 3) smokers could choose between two studies as opposed to the strict choice to participate or not (see 2. Methods). Thus, this study serves to both replicate and extend prior work in this area.

2. Methods

2.1 Participants and Procedure

This study is based on baseline data collected as part of a nationwide, population-based RCT of nicotine replacement therapy (NRT) sampling for smoking cessation induction (Carpenter, Alberg, Gray, & Saladin, 2010). Participants were proactively recruited online with coordination of a national market research firm, which maintains a national panel of individuals who have expressed interest in research. Individuals in the panel were emailed an invitation for participation in a "health survey," and if interested, were screened for eligibility online. Once eligibility was established (see below), individuals were presented with the opportunity to participate in one of 2 "studies about smoking." Both studies were described as free, time-limited (up to seven months in duration), minimally invasive (primarily telephone-based interactions with study staff), and inclusive of financial compensation (up to \$100 for participation). Individuals could then select 1) Quit Now

participation, 2) Quit Later participation or 3) no participation. If an individual selected participation, their contact information was forwarded to study staff. Over the telephone, study staff provided potential participants with a full description of the study selected online and obtained verbal informed consent. Upon receipt of written informed consent, baseline data were collected via mail questionnaire and telephone interview while follow-up data were collected via telephone interview.

The RCT's eligibility criteria included: a) age ≥ 18 , b) current smoker of ≥ 10 cigarettes per day, c) no more than monthly use of non-cigarette tobacco products, d) no previous NRT use, e) no quit attempt lasting > 1 week in the past year, f) no FDA-suggested precautions for nicotine lozenge use, and g) telephone access.

Of 4543 eligible smokers, 1587 (34.9%) declined participation altogether. Of those who remained, 726 (24.6%) chose Quit Now participation and 2230 (75.4%) chose Quit Later participation. Due to failure to obtain written informed consent and/or baseline data (no differences between Quit Now and Quit Later participants), the final sample ($N=1132$) consisted of 283 (39.0% of interested respondents) and 849 (38.1% of interested respondents) Quit Now and Quit Later participants, respectively.

2.2 Measures

This study focused on identification of 1) variables that differed between smokers in the Quit Now and Quit Later groups and 2) variables that predicted Quit Now vs. Quit Later group membership. Independent variables included: 1) demographics: age, gender, race/ethnicity, relationship status, and education; 2) smoking history: age at onset of daily cigarette smoking, number of cigarettes smoked per day in the past week, nicotine dependence (Heatherton, Kozlowski, Frecker, & Fagerström, 1991), number of prior serious quit attempts (self-defined by participants), and prior use of non-NRT smoking cessation treatment; and 3) psychological factors: intention to quit in next six months, confidence in ability to quit now, self-efficacy to cope with temptation to smoke (Velicer, DiClemente, Rossi, & Prochaska, 1990), and significant others' support of quit attempts. Other than cigarettes smoked per day and psychological factors, independent variables were reported via mail questionnaire.

2.3 Statistical Analysis

Independent samples t-tests and χ^2 tests identified differences between the Quit Now and Quit Later groups. All independent variables were then simultaneously entered into a logistic regression model to assess their ability to predict group membership (binomial outcome: 1=Quit Now and 0=Quit Later), both individually and collectively. Given the number of statistical tests (16 total), a Bonferroni correction was applied and $p < .003$ determined statistical significance.

3. Results

Table 1 summarizes the demographics, smoking history, and psychological factors for the Quit Now and Quit Later groups. The two groups were comparable on gender, relationship status, age at onset of daily cigarette smoking, nicotine dependence, and self-efficacy to cope with temptation. However, many significant differences emerged. First, Quit Now participants were younger, less likely to be White non-Hispanic, and less likely to be college educated than Quit Later participants. Second, Quit Now participants smoked fewer cigarettes per day, had a stronger history of prior serious quit attempts, and were more likely to have a history of non-NRT smoking cessation treatment use than Quit Later participants. Finally, Quit Now participants reported stronger intention to quit in next six months, more

confidence in their ability to quit now, and greater support from significant others related to quit attempts than Quit Later participants.

Results of the logistic regression model are shown in Table 2. The overall model was significant: $\chi^2(15)=275.98, p < .001$. Four variables independently predicted Quit Now vs. Quit Later group membership: age (OR=0.96), intention to quit in next six months (OR=1.49), self-efficacy to cope with temptation to smoke (OR=1.06), and significant others' support of quit attempts (OR=1.07).

4. Discussion

In a large, nationwide sample of adult smokers, 25% reported interest in a study for those who intend to quit in the next 30 days (Quit Now) while the remainder reported interest in a study for those who intend to quit, but not in the next month (Quit Later). Since Quit Now participation is a proxy for immediate readiness to quit, this finding is largely congruent with population-level distribution of readiness to quit, as measured by "stage of change" (Wewers et al., 2003). It is commonly found the majority of smokers want to quit (CDC, 2011b), yet only a minority are ready to do so in the near future. The factors that underlie the gap between readiness to quit now vs. later are not entirely clear, so this was designed to add to the literature that focuses on identification of variables that underlie immediate readiness to quit.

Several variables differed between Quit Now and Quit Later participants. The examination of demographics suggested Quit Now participants were younger, less likely to be White non-Hispanic, and less likely to be college educated than Quit Later participants. In general, however, there is mixed evidence that demographic variables are associated with immediate readiness to quit, as small or non-significant differences are often found between participants and non-participants in RCTs of smoking cessation treatments (Graham, Bock, Cobb, Niaura, & Abrams, 2006; Graham et al. 2008; Troyer et al., 2011). In contrast, participants in RCTs of smoking cessation treatments usually have a higher prevalence and number of previous quit attempts (Graham et al., 2006; Lemmonds, Mooney, Reich, & Hatsukami, 2004; Troyer et al., 2011), greater past use of smoking cessation treatment (Lemmonds et al., 2004), stronger intentions to quit (Ahluwalia et al., 2002; Graham et al., 2008; Woods et al., 2002), more confidence in their ability to quit (Woods et al., 2002), and greater self-efficacy toward quitting (Woods et al., 2002) than non-participants. Thus, this study's finding of group differences in smoking history and psychological factors between Quit Now and Quit Later participants converges with previous work.

Independent predictors of Quit Now vs. Quit Later group membership were identified via a logistic regression model. Encouragingly, with the exception of age, all significant predictors (intention to quit in next six months, self-efficacy to cope with temptation to smoke, and significant others' support of quit attempts) are addressable with intervention. Research shows delivery of smoking cessation treatments regardless of smokers' readiness to quit can increase motivation and prompt behavior change (Carpenter et al., 2011; Giardiana, Hyland, Bauer, & Cummings, 2004; Williams, Niemiec, Patrick, Ryan, & Deci, 2009). Specifically, provision of smoking cessation treatment can increase intention to quit, promote confidence and self-efficacy, foster social support, and decrease smoking, even in the absence of immediate readiness to quit. Thus, rather than waiting for individuals to seek smoking cessation treatment, clinicians can provide support, which in turn, can promote smokers' readiness to quit sooner rather than later. Importantly, smokers' past behavior (inclusive of serious quit attempts and non-NRT smoking cessation treatment utilization) did not independently predict Quit Now vs. Quit Later group membership in this study. As prior history cannot be changed, this offers some reassurance, but it is possible overlap among

smoking history variables negatively influenced their predictive utility in this study. Therefore, future attempts to understand immediate readiness to quit should continue to investigate smoking history.

Study results should be considered in light of some methodological limitations. First, exclusion of smokers with prior NRT use (22% of potential participants; Carpenter et al., 2011) limits the generalizability of study results. That said, since only 20–30% of adult smokers in the United States report NRT use (Cokkinides, Ward, Jemal, & Thun, 2005; Shiffman et al., 2008), study results likely apply to most smokers. Second, the Quit Now and Quit Later studies were not presented in a counterbalanced order, which may have influenced decisions about participation. Finally, 35% of eligible smokers outright refused participation and another group failed to provide written informed consent and/or baseline data. With an absence of information from these smokers, the reason for their non-participation is unknown. Clearly, novel methods to engage these smokers, who are seemingly unmotivated to quit, are needed.

In conclusion, this study focused on smokers who chose participation in a study for those who intend to quit now vs. quit later. Importantly, some variables that differed between Quit Now and Quit Later participants and many of those that independently predicted group membership are modifiable. Consequently, this study could be useful in the design of future RCTs of smoking cessation treatment, with the ultimate goal to maximize enrollment, prompt quit attempts, and lower the prevalence of smoking.

Acknowledgments

Role of Funding Sources

Funding for this study was provided by National Institute on Drug Abuse grants R01DA021619, K23DA020482, and T32DA007288. The National Institute on Drug Abuse had no role in the study design, collection, analysis, or interpretation of the data, the manuscript preparation, or the decision to submit the manuscript for publication.

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Highlights

- Most smokers are not ready to quit in the near future
- This study examines immediate readiness to quit in a nationwide sample of smokers
- Smokers who want to quit now versus quit later differ on multiple variables
- Most predictors of immediate readiness to quit are amendable to intervention

Table 1

Comparison of Quit Now and Quit Later Participants on Demographic, Smoking History, and Psychological Variables ^a

Variable	Quit Now (n = 283)	Quit Later (n = 849)	<i>p</i>
<u>Demographics</u>			
Age (years)	46.1 ± 11.7	50.6 ± 11.6	<.001
Gender ^b			.422
Male	33.2 (94)	35.8 (304)	
Female	66.8 (189)	64.2 (544)	
Race and ethnicity ^b			.001
White, non-Hispanic	76.7 (217)	85.3 (717)	
Other	23.3 (66)	14.7 (124)	
Relationship status ^b			.995
Single	43.8 (124)	43.8 (370)	
Married or partnered	56.2 (159)	56.2 (474)	
Education ^b			.001
High school graduate or less	35.0 (99)	23.9 (203)	
Some college	41.3 (117)	49.0 (416)	
College graduate or more	23.7 (67)	27.1 (230)	
<u>Smoking history</u>			
Age at onset of daily smoking (years)	17.6 (5.1)	17.4 (4.7)	.657
Cigarettes smoked per day (average in past week)	15.2 ± 8.6	18.9 ± 8.6	<.001
Nicotine dependence (current) ^c	4.3 (1.9)	4.2 (1.9)	.383
Total number of serious quit attempts (lifetime) ^d	2.5 ± 2.1	2.0 ± 2.2	<.001
At least one serious quit attempt (lifetime) ^{b,d}	88.2 (246)	78.2 (654)	<.001
Smoking cessation treatment used (lifetime) ^{b,e}	37.1 (105)	24.6 (209)	<.001
<u>Psychological Factors</u> ^f			
Intention to quit in next six months (0–10)	8.7 ± 1.9	5.8 ± 3.3	<.001
Confidence in ability to quit now (0–10)	5.1 ± 2.9	4.0 ± 3.0	<.001
Self-efficacy to cope with temptation to smoke (9–45)	22.4 ± 6.1	21.4 ± 5.9	.014
Significant others' support of quit attempts (5–25)	13.9 ± 5.5	10.3 ± 4.8	<.001

^aUnless otherwise noted, data are mean ± standard deviation.

^bData are percent (frequency); Frequencies may not sum to 1132 because of missing data.

^cHeatherton, Kozlowski, Frecker, and Fagerström, 1991.

^d“Serious” was self-defined by participants.

^eSmoking cessation treatment other than nicotine replacement therapy.

^fHigher scores indicate higher levels of each variable.

Table 2Summary of the Binomial Logistic Regression of Quit Now Versus Quit Later Participation ^{a,b}

Variable	Odds Ratio (95% Confidence Interval)	<i>p</i>
Age (years)	0.96 (0.94–0.97)	<.001
Gender		
Male (Reference)		
Female	0.98 (0.67–1.42)	.906
Race and ethnicity		
White, non-Hispanic (Reference)		
Other	1.72 (1.12–2.64)	.013
Education attainment		
High school graduate or less (Reference)		
Some college	0.64 (0.43–0.96)	.031
College graduate or more	0.81 (0.50–1.31)	.395
Relationship status		
Single (Reference)		
Married or partnered	1.00 (0.71–1.41)	.972
Age at onset of daily smoking (years)	1.00 (0.97–1.04)	.953
Nicotine dependence (current) ^c	1.11 (1.01–1.23)	.038
Total number of serious quit attempts (lifetime) ^d	1.01 (0.94–1.09)	.714
Serious quit attempt (lifetime) ^d		
No serious quit attempt (Reference)		
Serious quit attempt	1.16 (0.67–1.99)	.600
Smoking cessation treatment used (lifetime) ^e		
No treatment used (Reference)		
Treatment used	1.31 (0.90–1.90)	.165
Intention to quit in next six months (0–10) ^f	1.49 (1.34–1.63)	<.001
Confidence in ability to quit now (0–10) ^f	1.01 (0.95–1.08)	.705
Self-efficacy to cope with temptation to smoke (9–45) ^f	1.06 (1.02–1.10)	.001
Significant others' support of quit attempts (5–25) ^f	1.07 (1.03–1.11)	<.001

^aQuit Now participation coded as 1 and Quit Later participation coded as 0.^bLogistic regression model: chi-square (15) = 275.98, *p* < .001.^cSince nicotine dependence (Heatherton, Kozlowski, Frecker, & Fagerström, 1991) encompasses cigarettes smoked per day, and there was significant overlap between these variables (*r* = .51), only the former was included as a predictor.^d“Serious” was self-defined by participants.^eSmoking cessation treatment other than nicotine replacement therapy.^fHigher scores indicate higher levels of each variable.