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‘Closet’ Quit Attempts: Prevalence, Correlates and Association with Outcome

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Abstract

Aims—To examine the 1) prevalence, 2) predictors, and 3) cessation outcomes of smokers who engage in undisclosed quit attempts.

Design—Online survey (N=524), with balanced recruitment of current smokers (55%) and past-year quitters (45%). Participants were daily smokers (current or previous) who had at least one quit attempt in the past year.

Measurements—Respondents were grouped on whether they did vs. did not make advanced disclosure to others of their most recent quit attempt.

Findings—Almost half (n=234; 45%) reported that their most recent quit attempt was undisclosed to anyone in advance. Those who planned their quit attempt in advance (OR = 0.10; 95% CI: 0.05 – 0.23) and those who used behavioral treatment (OR = 0.14; 95% CI: 0.05 – 0.43) were less likely to make ‘closet quit attempts’, while those who rated their attempt as being serious (OR = 2.52; 95% CI: 1.16 – 5.46) and those who deemed social support to be unhelpful (OR = 1.91; 95% CI: 1.24 – 2.95) were more likely to make such attempts. Closet quit attempters were more likely to achieve 30 days of abstinence than were those who made advanced disclosure (67% vs. 58%; adjusted OR 1.8; 95% CI: 1.1–2.8), but there were no differences for achieving six months of abstinence (52% vs. 49%; adjusted OR 1.2; 95% CI: 0.7–2.0).

Conclusions—Attempting to quit smoking without telling anyone in advance is common and does not appear to impede success. These findings do not support blanket advice to smokers to tell others about pending quit attempts.

Introduction

An important goal of research into smoking cessation is to determine the best advice to give smokers making a quit attempt. One piece of advice that is commonly given is to tell others about the pending quit attempt. For example, the U.S. Public Health Service guidelines (1)

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recommend that smokers “tell family, friends, and coworkers about quitting, and request understanding and support” (pg. 42). One rationale is that it raises the social cost of failure and so raises the motivation to remain abstinent. Another is that it enables others to provide help with the quit attempt, either by avoiding exposure to smoking cues or providing moral support. However, anecdotal evidence suggests that many smokers prefer not to tell others about their quit attempts. Smokers may make “closet quit attempts” if they believe disclosure will be unhelpful, or if they lack confidence in success and want to avoid the stigma or embarrassment associated with failure. To our knowledge, no study has yet examined systematically the prevalence of disclosed vs non-disclosed quit attempts, or whether disclosure is associated with success.

Deciding not to tell others of a forthcoming quit effort, i.e., making a closet quit attempt, may reflect perceptions of social support for quitting at the time of the attempt. While intuitive clinical practice supports the notion that strong social support is an important factor to promote optimal success during a quit attempt, studies linking social support to smoking cessation have been mixed. A number of prior studies show that cessation outcomes are better among smokers who receive social support vs. those who do not (or receive less) (2–6). However, most (7, 8), but not all (9) randomized intervention trials in which smokers receive social support vs. not generally fail to show any therapeutic effect. The guidelines noted above do not recommend extra-treatment social support for cessation attempts. The absence of this recommendation was based largely on a recent Cochrane meta-analysis (10) which showed no substantial benefit of partner/other support for smoking cessation. A recent review highlighted the discrepancy between theory and evidence and challenged the field to better clarify the value of social support (11); it may be important to consider the *timing* and *type* of support rather than just the presence of support. For example, support may be most effective at the beginning, in preparation for a quit attempt vs. later, when the attempt is already underway. Additionally, positive support may be conducive towards making a quit attempt, while negative support (e.g., pressure, badgering) may undermine the attempt once it has been made.

We could find no prior studies to examine the notion of closet quit attempts: whether it even exists, how common it is, who engages in closet quit attempts and why, or its link to abstinence. The threefold purpose of this study was to examine the 1) prevalence, 2) predictors, and 3) cessation outcomes of smokers who engage in closet quit attempts. Our focus is not on undisclosed (closet) smoking, i.e., status as a current smoker but with few or no knowledgeable others. We defined a closet quit attempt as one that was undisclosed to others prior to it being made. Disclosure of the quit effort after it had already been attempted was of secondary interest, based on the presumption that the success of the effort would influence telling of others.

Methods

Five hundred and seventy five participants were recruited for a cross-sectional survey through online channels (Zoomerang Market Tools), using a panel of individuals who have indicated willingness to be contacted for research. The panel is profiled every six months to verify accuracy and legitimacy of respondent profiles, and sampling tools decrease inclusion of people who provide invalid survey responses. Potential study participants were sent a link to an online screener to determine study eligibility. Those who were eligible read a brief introduction of the survey and were invited to continue. Consent was implied for those who did. Respondents were offered “points” for survey completion, which they could use for a variety of purposes (purchase products, services, etc). All responses were anonymous; the response rate was not recorded. From the initial sample of 575 respondents, 51 (9%) were subsequently excluded due to internal inconsistencies, resulting in a final sample size of 524.

Eligibility required that participants: (1) were age 18+ yrs, (2) were a current or ex-smoker, and (3) had tried to quit smoking in the past year. Current smokers were defined as a) daily smoker (≥ 25 days/month), b) ≥ 10 cigarettes per day, and c) for at least one year. Ex-smokers were defined as a) previous daily smokers who b) had been quit for at least 1 week but not more than one year (i.e., made successful quit attempt within past year but not within past week). The online panel consists of approximately 70% females. Given disparate rates of quitting among men/women (12, 13), and because we suspected a possible gender difference in disclosure of quit attempts, we over-sampled men ($n=244$, or 47% of sample) to ensure a gender balance.

Given our aim to examine the relationship between undisclosed quit attempts and cessation, we also balanced recruitment based on status as a current ($n=286$; 55%) vs. former smoker ($n=238$; 45%). We restricted our sample to ex/current smokers who had recently tried to quit (in the past year) to increase our sensitivity to detect closet quit attempts. We did not expand the latency to quit attempts beyond 1 year in an effort to reduce memory bias from distant attempts. We are mindful that a memory bias is still likely, in which past quit attempts may be recalled with less accuracy, particularly if undertaken haphazardly (14, 15) as might be the case in closet quit attempts.

With the most recent quit attempt as reference, we examined a) whether it was planned or spontaneous, b) methods used during the attempt, c) advanced disclosure of the attempt, and d) post-attempt disclosure. Advanced disclosure was asked as follows: “Before I made my most recent attempt to quit ...” with responses of a) I didn’t tell anyone that I was going to quit, b) I told someone that day that I was trying to quit, c) I told someone 1 day in advance that I was going to try to quit, d) I told someone 2–7 days in advance that I was going to try to quit, e) I told someone 8–30 days in advance that I was going to try to quit, or f) I told someone over 1 month in advance that I was going to try to quit. Post-attempt disclosure was asked in a separate item with parallel response format. Because our focus was more on disclosure vs. not (and not on timing of disclosure), we grouped responses [b–f] as reflective of those who disclosed their quit attempt vs. [a], as reflective of those who did not; i.e., closet quit attempts.

Finally, we examined the following as potential influences on disclosure, each asked in reference to the most recent quit attempt (one exception, noted below):

Partner Support

The Partner Interaction Questionnaire-Brief (16) is a 10-item tool to assess both the positive (e.g., encouragement) and negative (e.g., nagging) dimensions of support for smoking cessation. For our purposes, it was adapted to generalize to “people in your life who you consider to be your main source(s) of support.” Within our sample, Cronbach’s alpha was 0.82 and 0.84 for positive and negative subscales.

Confidence in Quitting

On the assumption that disclosure might reflect self-efficacy to quit (or lack of it), we determined confidence to quit (or stay quit) using a single item, presented in 0–10 scale. This was asked in general, not specific to most recent quit attempt.

Dyadic Efficacy

Dyadic efficacy refers to smokers’ confidence in their abilities to work together as a team with their partner to quit smoking and cope with the practical and emotional challenges of quitting. Our prior work (17) suggests a relationship between dyadic efficacy and smoking cessation. Dyadic efficacy was introduced with the following: “Think about the *ONE* person

in your life who you consider to be your main source of support. During your most recent quit attempt, how confident were you that you and your support person could work together as a team to..." Example items included "...Focus on the benefits of quitting smoking?" and "...Deal with the ups and downs of trying to quit?" The eight items ($\alpha = 0.95$) were presented and averaged using a 0 to 10 response format (0 = not at all confident; 10 = extremely confident), with a possible range of 0–10.

Barriers to Disclosure

We are aware of no formal scale to assess barriers towards telling others of quit attempts. Thus, we adapted items from an instrument assessing barriers to calling a quitline (18). The original instrument included 28 items across 5 factors (stigma, low appraisal of service, no need for assistance, poor fit with service, and privacy concerns) assessing attitudinal barriers to seeking quitline services. Because we subtracted some items (poor fit with service), changed the wording on others (to fit with the concept of disclosing quit attempts to others), and added others, we conducted exploratory factor analysis with promax rotation (19) to verify the factor structure of the revised instrument. All items were averaged using a 4-point likert scale (1 = not at all true for me; 4 = completely true for me). We retained factors when scree plots showed a substantial drop in the amount of information provided when an additional factor was included, and when eigenvalues were approximately 1.0 (19). Items with factor loadings over 0.5 were retained when they also did not crossload (or load on any other factor greater than 0.3) (20). Four factors were retained, explaining 62% of the variance. Readers interested in the resulting 21-item scale can contact the first author. The four factors were: 1) *Stigma* (7 items: Cronbach $\alpha = 0.87$); example: "If I told someone I was trying to quit, I would be embarrassed," 2) *Support Not Deemed Helpful* (5 items: $\alpha = 0.83$); example: "If I told people I was trying to quit, they probably wouldn't tell me anything new," 3) *Damaging or Negative Support* (4 items: $\alpha = 0.82$); example: "If I had told someone that I was trying to quit, I would just get pestered or nagged," and 4) *Dismissed Need for Social Support* (5 items: $\alpha = 0.82$); example: "I wanted to be able to say that I quit on my own without help."

Data Analyses—Factor analysis of barriers to disclosure is described above. Associations between closet quit attempts (see above for definition) and demographic, smoking history, and psychosocial correlates were examined using chi-square and t-tests. Next, including only those variables that differed significantly between groups ($\alpha=0.05$) as covariates, a multivariable logistic regression model examined predictors of closet quit attempts. Finally, we examined the relationship between closet quit attempts and their duration. Using logistic regression (unadjusted and adjusted models), we examined whether non-disclosers, relative to disclosers, were more likely to achieve a minimum of 30 days of abstinence, and 6 months of abstinence. For each, we restricted analyses to those respondents whose most recent quit attempt was ≥ 30 days, and ≥ 6 months prior to the survey (we did not want to discount a quit attempt as not lasting 30 days if occurred < 30 days prior). For all analyses, α was set at 0.05.

Results

Survey Sample

The study sample (Table 1) consisted primarily of middle age adults (mean 38 yrs, $SD = 12.2$), Caucasian (92%) smokers. Over half (52%) were married, almost all (97%) had completed high school, and 32% lived with a smoker. By design, approximately half (47%) of the sample was male, and 45% had been quit for at least one week. Among current smokers ($n=286$), 34% were motivated to quit in the next month, and an additional 53%

were motivated to quit in the next six months. Among ex-smokers (n=238), 53% had been quit 1–6 months, and 34% had been quit 6–12 months.

Prevalence of Undisclosed Quit Attempts

Of the 524 respondents, 234 (45%) made a closet quit attempt, i.e., did not disclose their most recent quit attempt to others. Of these, 94 (40%) did tell others of the attempt after it was made, and 140 (60%) did not; i.e., no one else knew of the quit attempt, either before or after it was made. We presumed that telling others of the quit attempt after it was made would be a function of how successful the attempt was. However, there were no differences in quit attempt duration between never-disclosers (median = 56 days) and post-attempt-only disclosers (median = 60 days; Mann Whitney $p = .9$). Less than half (42%) of closet quit attempts were spontaneously made.

Of those who did disclose the quit attempt in advance (n=290), most (90%) told their spouse or significant other (based only on those who reported having either) and most (79%) told a small number (modal response: 1–5) of close family members. However, many of these same smokers neither told any of their friends or neighbors (43%), nor anyone at work (62%) that they were trying to quit. Again among disclosers, 29% told someone on the day of the quit attempt, 9% disclosed one day prior, 29% disclosed 2–7 days prior, 18% disclosed 8–30 days prior, and 15% disclosed >1 month prior.

Predictors of Undisclosed Quit Attempts

Table 1 presents bivariate predictors of closet quit attempts. Those who did not tell others of a pending quit attempt smoked fewer cigarettes per day and had lower nicotine dependence, had a higher income, were more confident in their ability to quit, and were less likely to be fully open about their smoking. Reflecting on their most recent quit attempt, non-disclosers were less likely to plan it advance and use both pharmacologic and behavioral treatment. However, smokers who made closet quit attempts were more likely to consider it a ‘serious’ quit attempt than were smokers who shared their quit attempt with others. Primary barriers to disclosure were the perceptions that social support was neither helpful nor needed during the last quit attempt; receipt of social support was a facilitator of disclosure. Multivariate predictors of closet quit attempts are presented in Table 2. After adjusting for all other variables in the model, closet quit attempts were predicted by lack of advanced planning of most recent quit attempt, no use of behavioral treatment, self-reported seriousness of most recent quit attempt, and the perception that social support was unhelpful.

Relationship to Quitting

Unadjusted and adjusted (controlling for significant predictors of disclosure; Table 2) associations between disclosure and duration of quitting are presented in Table 3. Smokers who made closet quit attempts were *more* likely to achieve 30 days of abstinence (67%) than were smokers who did disclose (58%), even after adjustment (OR = 1.8; 95% CI: 1.1 – 2.8). There were no differences between non-disclosers vs. disclosures on the ability to achieve 6 months of abstinence (52% vs. 49%). Among those who did not disclose their most recent quit attempt in advance, the median length of the attempt was 60 days, vs. 21 days among those who did disclose (Mann Whitney $p = .3$). Excluding ex-smokers (whose most recent quit attempt is still ongoing), parallel numbers among current smokers only were 6 vs. 5 days (Mann Whitney $p = .8$).

Discussion

This study represents what we believe is the first examination of undisclosed attempts to quit smoking; i.e., closet quit attempts. Among smokers who attempt to quit, many (45%) in

the current sample) do not tell anyone of the attempt in advance. Many closet quit attempts are spontaneous – but not exclusively. There were very few sociodemographic differences between non-disclosers and disclosers, indicating that closet quit attempts are common across different types of smokers.

Closet quit attempts were largely predicted by lack of advanced planning of the attempt. Those who plan their quit attempts in advance are less likely to make closet quit attempts. This relationship remains unclear however. It is possible that disclosure led smokers to plan their attempts more thoughtfully, with time. It is equally possible that advance planning of a quit attempt allowed more time for disclosure. Use of treatment during the most recent quit attempt, either pharmacologic or behavioral, was also related to disclosure, and again the temporal and causal relationships are unclear. It is possible that disclosure leads smokers to engage in more intensive treatment options. It is also possible that outward signs of a quit attempt, as is particularly the case when a smoker engages in behavioral treatment, lead (or even compel) that smoker to divulge the attempt; i.e., it may be that disclosure is tied to overt changes in behavior when trying to quit. Thus, one interpretation is that smokers disclose a quit attempt only when they have to.

We anticipated that a number of psychosocial influences would predict the decision to keep the quit attempt private. Non-disclosure was more common among smokers who received lower levels of positive social support during their quit attempt, but was more likely among smokers who considered social support to be either unhelpful or unnecessary during the attempt. Contrary to our expectation, non-disclosure was unrelated to either negative social support or stigma of telling others. Thus, it may be the absence of a positive (lack of, or devalued opinion of social support), rather than the presence of a negative (nagging or hassle from others, embarrassment of disclosure) that is the important determinant of disclosure vs. not. Clearly the nature and quality of the support is important.

Within our sample, two thirds (67%) of smokers who made closet quit attempts sustained that attempt for at least 30 days, which was higher than the success rate for smokers who did tell others of the attempt (58%). Since our sample had targeted recruitment of both current and ex-smokers, this should not be interpreted as meaning that 67% of smokers who engage in undisclosed quit attempts will achieve success. Nonetheless, consistent with the literature on spontaneous quit attempts (21–23), our data indicate that many undisclosed quit attempts are successful. The relationship between disclosure and quitting was evident even after controlling for advance planning, suggesting an independent association. It remains unclear if non-disclosure is protective of quitting success, and it is premature to abandon the notion that social support is important in quitting. What is clear is that many smokers can sustain quit efforts in the absence of telling anyone in advance. Disclosure to others does not seem critical.

It is equally informative to note that prior quitting history was not associated with disclosure of attempts to quit. We anticipated that the decision to disclose vs. not would reflect one's level of frustration and embarrassment (which we did not directly assess) that might derive from prior failures in quitting. To the contrary, neither the amount nor duration of prior quit attempts was associated with disclosure. Confidence in quitting was also unrelated to disclosure, as was dyadic efficacy. If smokers are deciding to keep quit attempts private, this does not appear to be driven by internal feelings of shame, nor is it driven by a deflated sense of self- or dyadic efficacy. The cognitive processes that underlie the decision to disclose are clearly worthy of further research.

Treatment efforts should recognize that not all smokers will engage others in the quit process. Many smokers will choose to go it alone. Engaging these smokers in evidence-

based treatment is still important. Quitlines represent an excellent, evidence-based treatment option (24) for smokers who prefer to maintain anonymity during the quit process. Quitlines which offer pharmacotherapy have been shown to increase utilization and improve quit rates (25). Clinically, it is unclear if smokers who are considering a quit attempt should be counseled to disclose the attempt to others or not. The literature on social support is mixed, so the best approach might be to assess the individual's perception of what support might exist and how to strengthen it.

The cross-sectional design of this survey constrains study interpretation. A better understanding of undisclosed quit attempts would come through a longitudinal approach linking disclosure to psychosocial correlates and downstream smoking behavior. Further, our focus was on recent quit history, i.e., within the past year, with the intent to reduce recall bias of events that occurred in the distant past. Nonetheless, recall error is still possible (26). Finally, the study sample and the way it was recruited introduce the possibility of bias. Internet samples are often under-representative of older, non-white and less educated smokers (27), though prior research has shown that such sampling bias does not necessarily imply a bias in associations between variables (28).

In sum, this study shows for the first time that a substantial proportion of quit attempts are made without any disclosure to others, and that such closet quit attempts do not appear to impede abstinence. Replication of these results using larger samples is needed. Facilitating use of evidence based treatment for anonymous quit attempts will further enhance quitting success.

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Table 1

Characteristics of smokers who did or did not disclose their most recent quit attempt (QA) in advance (N=524)

	Did Not Disclose QA In Advance (n=234)	Disclose QA In Advance (n=290)	p
Age (mean, SD)	39.0 (12.5)	37.0 (12.0)	.07
% Female	52%	55%	.6
% Non-hispanic white	92%	90%	.6
% Married	49%	53%	.3
% Some college or more	71%	73%	.7
% Household income <\$40,000	46%	56%	.03
% Live with a smoker	29%	33%	.3
% somewhat/very concerned risks of smoking	81%	88%	.1
Cigarettes/Day	17.6 (8.5)	19.6 (9.7)	.01
FTND ^a	4.5(2.0)	5.1 (2.1)	.03
Number of prior quit attempts ^b			
1	7%	4%	.4
2–5	54%	59%	
6+	39%	37%	
Longest ever quit attempt, days	530.4 (1263)	477.4 (1212)	.6
Household smoking policy			.1
Unrestricted indoor smoking	32%	34%	
Smoking indoors at certain times/places	15%	20%	
No smoking indoors	54%	46%	
Openness of smoking			.002
No one/very few know ('closet smoker')	19%	9%	
Fully open about smoking	81%	91%	
During most recent quit attempt:			
Planned most recent quit attempt			<.001
Not at all; "I just did it"	42%	16%	
Planned for later that same day	5%	5%	
Planned 1 day in advance	12%	10%	
Planned it > 1 day in advance	30%	64%	
Other/Do not remember	11%	5%	
Used any cessation medication	44%	66%	<.001
Used any behavioral treatment	7%	16%	.004
Self-reported seriousness about quitting			.004
Not at all or somewhat serious	12%	22%	
Really or Moderately serious	88%	78%	
Psychosocial barriers/facilitators to disclosure ^c			
Positive social support [possible range 0–20]	7.7 (4.5)	8.8 (4.8)	.007
Negative social support [0–20]	7.1 (4.7)	7.6 (4.5)	.3
Confidence in quitting [0–10]	7.0 (2.8)	6.5 (2.8)	.05
Dyadic self-efficacy [0–10]	5.5 (2.7)	5.8 (2.6)	.3

	Did Not Disclose QA In Advance (n=234)	Disclose QA In Advance (n=290)	p
Stigma [1–4]	1.4 (.5)	1.4 (.6)	.3
Support not deemed helpful [1–4]	2.6 (.8)	2.2 (.8)	<.001
Damaging or negative support [1–4]	2.0 (.8)	2.0 (.8)	.5
Dismissed need for social support [1–4]	2.7 (.8)	2.3 (.8)	<.001

^aFagerstrom Test for Nicotine Dependence among current smokers only (n=286)

^bby design, all respondents had at least one prior quit attempt

^cwith exception of confidence in quitting, asked in reference to most recent quit attempt; see text for details

Table 2

Multivariable Logistic Regression Model Examining Predictors of Closet Quit Attempts

	OR for Closet Quit Attempt	95% CI
% Household income		
<\$40,000	referent	
≥\$40,000	1.13	0.61 – 2.09
Cigarettes/Day	1.00	0.96 – 1.05
FTND	0.91	0.76 – 1.08
Openness of smoking		
No one/very few know ('closet smoker')	referent	
Fully open about smoking	0.50	0.20 – 1.18
Most Recent quit attempt:		
Advanced Planning		
Not at all; "I just did it"	referent	
Planned for later that same day	0.65	0.18 – 2.37
Planned 1 day in advance	0.38	0.16 – 0.90
Planned it > 1 day in advance	0.10	0.05 – 0.23
Use of cessation medication		
None	referent	
Yes	0.97	0.50 – 1.86
Use of behavioral treatment		
None	referent	
Yes	0.14	0.05 – 0.43
Self-reported seriousness		
Not at all or serious	referent	
Somewhat or very	2.52	1.16 – 5.46
Psychosocial barriers/facilitators to disclosure		
Receipt of positive social support	1.00	0.89 – 1.03
Confidence in quitting [0–10]	1.06	0.95 – 1.19
Support not deemed helpful	1.91	1.24 – 2.95
Dismissed need for social support	1.12	0.72 – 1.76

Table 3

Relationship between Disclosure of Quit Attempts^a and Duration of Abstinence

	Unadjusted			Adjusted ^f		
	%	OR	95% CI	OR	95% CI	
<u>Achieve >30 days of abstinence on most recent QA²</u>						
Disclosed quit attempt in advance	58%	1.0	--	1.0	--	--
Did not disclose quit attempt in advance	67%	1.5	1.01 – 2.17	1.8	1.1 – 2.8	
<u>Achieve > 6 months of abstinence on most recent QA³</u>						
Disclosed quit attempt in advance	49%	1.0	--	1.0	--	--
Did not disclose quit attempt in advance	52%	1.1	0.70 – 1.71	1.2	0.7 – 2.0	

^a of quit attempts (QA) made in past year

^f adjusted for confounders of disclosure: a) planning of prior quit attempt, b) use of behavioral treatment, c) seriousness of prior quit attempt, and d) unhelpful support barrier, as well as other common predictors of abstinence: e) smoking quantity, f) income, and g) use of medicinal treatment

² restricted to those whose most recent QA ≥ 30 days prior (N=460); see text for details

³ restricted to those whose most recent QA ≥ 6 months prior (N=313); see text for details