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Understanding What Changes Adults in a Smoking Cessation Study Believe They Need to Make to Quit Smoking: A Qualitative Analysis of Pre- and Post-Quit Perceptions

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Abstract

Introduction: Most individuals who try to quit smoking will not succeed even if they use evidence-based treatment. Qualitative methods can help identify cessation treatments' limitations and suggest adaptations to increase treatment success.

Methods: Rapid qualitative analysis was conducted on data from 125 adults who smoked daily (48% female; 44% White) and participated in a smoking cessation trial and completed qualitative interviews 2-weeks prequit, reporting on changes they needed to make to quit, and 100 adults (50% female; 49% White) who completed a second interview 2-weeks post-quit, reporting changes they had made.

Results: The anticipated changes reported prequit (in order of frequency) were: identify smoking triggers (without a coping plan), focus on benefits of quitting, reduce exposure to others smoking, make other health changes, reduce exposure to non-social smoking cues, and reduce alcohol consumption. Many participants were unable to identify specific changes that would aide their cessation success. Changes reported post-quit included: use the 4 D strategies (Delay, Drink

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Declaration of Interests

Dr. Baker reported receiving personal fees from the National Cancer Institute for editing a monograph and grants from the National Cancer Institute. The other authors have no conflicts of interest to declare.

CRedit Form

Adrienne L. Johnson: Conceptualization, Data curation, Formal Analysis, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. Tanya R. Schlam: Conceptualization, Validation, Visualization, Writing – review & editing. Timothy B. Baker: Conceptualization, Funding acquisition, Supervision, Visualization, Writing – review & editing. Megan E. Piper: Conceptualization, Data Curation, Project Administration, Supervision, Validation, Visualization, Writing – review & editing.

water, Deep breathing, Distract), reduce exposure to non-social smoking cues, focus on benefits of quitting, change daily routine, make other health changes, reduce exposure to others smoking, and get support from loved ones. Most changes reported post-quit were consistent with clinical practice guidelines, however use of cessation medication was the least reported theme.

Conclusion: Prior to quitting, over a third of participants were unable to identify changes to increase cessation success. Those who could focused on triggers and cues for smoking. Post-quit, participants reported using cessation strategies encouraged during study cessation counseling.

Public Health Significance: Brief qualitative interviews were used to begin to understand adults' perceptions of changes needed to successfully quit smoking two weeks pre and post-quit attempt. Prior to quitting, analyses highlighted that many participants were unable to identify specific changes that would aide their cessation success. Conversely, most changes reported post-quit were consistent with clinical practice guidelines, however use of cessation medication was the least reported theme. Future treatments should focus on increasing patient understanding of the importance of making behavioral changes as well as understanding that using cessation medication is another key behavioral change that facilitates cessation success.

Introduction:

Every year in the U.S. over 21 million people try to quit smoking cigarettes (Creamer et al., 2019). While evidence-based smoking cessation treatments can double or triple cessation success rates (Fiore et al., 2008), almost 4 out of 5 people who try to quit smoking using pharmacotherapy and counseling interventions will return to smoking within a year (Babb et al., 2017; U.S. Department of Health and Human Services, 2020). While researchers have some understanding of how smoking cessation pharmacotherapy works (i.e., via craving suppression), they have limited understanding of how counseling and behavioral interventions work (Baker & McCarthy, 2021; Bolt et al., 2012). A central limitation of existing behavioral treatments is the identification of mechanisms that relate to treatment success. However, despite demonstrating benefit of behavioral treatment for smoking cessation (particularly in addition to pharmacotherapy) decades of existing tobacco treatment research have failed to adequately identify the 'what' that makes behavioral intervention beneficial (Baker & McCarthy, 2021).

In addition to examining the mechanisms of change, it is important to understand patient beliefs about change. How do people who smoke view the cessation process? What changes do they think they need to make? What help do they think they need to quit successfully? Prochaska and DiClemente were the first to examine patient-led perspectives on needed changes to their smoking behaviors (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1982, 1983). They asked people who had recently tried to quit smoking to retrospectively rate how frequently they used 10 different strategies to quit and found that those who successfully quit smoking more consistently made behavioral, rather than cognitive, changes (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1982). Notably, this work focused on evaluating participants' readiness for change, rather than examining participants' insights into changes needed to successfully quit (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983). Hammond and colleagues focused on patient knowledge of evidence-based cessation methods by asking 616 Canadian adults

who smoke cigarettes to complete a survey on the perceived effectiveness of cessation treatments. They found a large gap in knowledge between people who smoke and the scientific community, with a third to half of respondents unaware of existing evidence-based smoking cessation treatments and the majority not believing these treatments would be beneficial (Hammond et al., 2004). More recent efforts have been made to utilize patient perspectives when developing novel cessation treatments (Fergie et al., 2019; Oliver et al., 2018; Russell et al., 2018), but none of these studies specifically examined patient perspectives on what was needed to quit and what was reportedly used to quit. Given our limited understanding of what mechanisms make smoking cessation behavioral therapies successful (Baker & McCarthy, 2021), it may be helpful to examine patients' thoughts about the changes they believe would improve their cessation success. Unfortunately, only two of the above studies used qualitative methods (Fergie et al., 2019; Russell et al., 2018).

The use of a qualitative approach to examine patient insights may inform our understanding of mechanisms leading to cessation success, as well as highlight potential areas of improvement for existing behavioral treatments. Qualitative research aims to identify, describe, and interpret perspectives of individuals or groups occurring in their natural (c.f., experimental) setting using non-numerical data (Al-Busaidi, 2008; O'Brien et al., 2014). A growing body of research has highlighted the utility of qualitative research in public health (Al-Busaidi; Benson & Britten, 2002; Fletcher et al., 2019; Leung, 2015; Weiner et al., 2011) as it allows for more in-depth answers, particularly from a patient perspective, that can potentially fill gaps in knowledge related to barriers to health behavior change (Al-Busaidi, 2008; Benson & Britten, 2002; Weiner et al., 2011).

For years, many within the scientific community have viewed qualitative research with skepticism due to its purported lack of rigor, validity, replicability, and feasibility (Al-Busaidi, 2008; Hamilton, 2013; Leung, 2015). However, methodologies such as triangulation, purposeful sampling, and thorough documentation can increase the rigor of qualitative research (Al-Busaidi, 2008; Leung, 2015; Palinkas et al., 2015; Patton, 1980; Silverman et al., 1990). The use of technology to facilitate organization and analysis of data is both feasible and efficient (Averill, 2002) allowing even more researchers to use qualitative methods to rigorously address key questions. Despite the availability and utility of qualitative techniques, no prior research has used qualitative methods to examine the changes patients who smoke believe would allow them to quit smoking and the changes they report actually making during a quit attempt.

Rapid qualitative analysis is one technique to address the limitations associated with qualitative research, by allowing for rigorous, team-based analysis of patient-led qualitative data that is iterative and timely (Beebe, 2001; Hamilton, 2013; Taylor et al., 2018). Rapid analysis produces similar themes to traditional qualitative analysis in a more efficient, less resource intensive way (Gale et al., 2019; Nevedal et al., 2021). A deductive rapid qualitative analytic approach summarizes interviews based on existing theoretical knowledge that is built into the interview guide, and then places these summaries in a matrix format (e.g., using MS Excel) to organize the data, facilitating a rigorous and rapid review of the data (Averill, 2002; Hamilton & Finley, 2019). Importantly, while this work is more top-down in nature than some other qualitative approaches, it does draw themes directly

from the responses provided by participants. The top-down nature of the work stems from the utilization of a semi-structured interview guide informed by existing theory, thereby focusing participant answers on areas of interest to the researcher. This approach has been successfully utilized in healthcare research (Fletcher et al., 2019) and yields effective and rigorous results (Nevedal et al., 2021) but has yet to be utilized in the nicotine dependence literature. Although rapid analysis does not offer the same level of in-depth evaluation of qualitative data, given the ability of this approach to produce similar results to more traditional qualitative methods in a timelier manner, the authors chose to utilize this technique in the present study.

Using a deductive rapid qualitative analytic approach of two brief qualitative interviews, we examined the changes adults who were part of an aided cessation study *anticipated* needing to make to successfully quit and what changes they actually *made* during their quit attempts to help themselves quit successfully. Due to the exploratory nature of this research, no specific hypotheses were made and this study was not preregistered.

Method:

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study (Kazak, 2018).

Participants

This research was conducted with participants from a larger (N=1251) comparative effectiveness smoking cessation trial (Baker et al., 2021) and was designed to understand what changes participants believed they needed to make to successfully quit smoking and what changes they actually made. Inclusion criteria for the cessation trial were: English speaking; smoking 5 cigarettes per day for the last 6 months; exhaled carbon monoxide (CO) 5ppm; 18 years old; desire to quit smoking; not engaged in cessation treatment; reported no use of pipe tobacco, cigars, snuff, e-cigarettes or chewing tobacco in the last 30 days; phone access; willing and able to use both nicotine patch and varenicline; able to attend clinic visits for the next 12 months; and, if female, not pregnant and willing to use an acceptable form of birth control. Exclusion criteria included: current treatment for psychosis; suicidal ideation in the past year; a suicide attempt within the prior 10 years; on dialysis or severe kidney disease; hospitalization for a stroke, heart attack, congestive heart failure, or uncontrolled diabetes mellitus within the past year; history of seizure within the last year; currently taking bupropion, varenicline, or nicotine replacement therapy and intention to continue; history of allergic reaction to a study medication; and current participation in another smoking cessation study. In the parent trial, of the 3213 individuals who completed telephone screening, 582 failed telephone or in person screening, 1297 declined to participate after telephone or in person screening; 79 participants then withdrew after visit 1 and 4 additional individuals were excluded for other reasons. Participants were recruited via online advertising (e.g., social networking sites). Participants were randomized to receive varenicline alone or varenicline and the nicotine patch for either 12 or 24 weeks. All participants were offered six 15-minute counseling sessions (delivered in person and via telephone) that focused on explaining medication use, providing support, teaching coping

skills, and increasing motivation to quit. Full study procedures for the cessation trial can be reviewed elsewhere (Baker et al., 2021).

All participants in the cessation trial were compensated with \$40 for the first (baseline) visit and \$10 for a phone assessment 2 weeks post-target quit day (TQD). Both assessments included self-report questionnaires, clinical interviews, and brief qualitative interviews. While all participants were asked to complete these interviews, we randomly selected a subset ($n = 100$) to analyze at the prequit time period using a random selection generator in SPSS. The decision to refrain from analyzing all 1251 participant's qualitative responses was made based on previous literature highlighting that informational redundancy (i.e., the point when analysis of data does not reveal novel themes/codes) for qualitative studies of an idiographic can be achieved with sample sizes much smaller than our original data sample (Robinson, 2014). Eligibility criteria for the current analysis were the same as for the parent study, with the addition of needing to have completed both qualitative interviews. We also selected for equal numbers of male and female participants and White and African American participants. The initial sample size of 100 was selected to allow for qualitative examination of specific subpopulations known to have lower cessation rates (i.e., we oversampled to ensure adequate representation by gender and race). However, due to an analytic error, 25 of the 100 participants did not have post-quit interview data. Therefore, we conducted a second wave of purposeful random sampling to supplement the missing data (matching for the race and gender of those participants missing post-quit interview data). As this second wave of sampling occurred later in the thematic development process, all original participants were retained for analysis of the first domain (i.e., anticipated changes needed to quit smoking), resulting in a sample size of 125 for the pre-quit domain and 100 for the post-quit domain (i.e., changes made). All study procedures were reviewed and approved by the University of Wisconsin's Health Sciences IRB.

Measures

As part of the baseline assessment, participants self-reported lifetime psychiatric history (coded as 'absent' or 'present') and completed the Fagerström Test for Cigarette Dependence (FTCD; Heatherton et al., 1991). The first item of the FTCD was used to determine dependence level coded as 'High' (smokes in the first 30 minutes of the day) or 'Low' (smokes after 30 minutes) consistent with prior research validating the use of the single item (Baker et al., 2007).

Qualitative Data Collection and Analyses

Participants completed two structured interviews lasting approximately 5–10 minutes each. One interview occurred in person two weeks before their TQD and prior to any cessation counseling, and the second occurred over the phone two weeks after their TQD. At the pre-TQD interview, participants were asked: "What do you think you need to change about your life to quit smoking?" At the 2 weeks post-TQD interview, participants were asked: "What have you changed in your life to help you quit smoking or stay quit?" Interviews were conducted by bachelor's level Health Counselors and were recorded and transcribed.

Multistage purposeful random sampling methods (Onwuegbuzie & Leech, 2007) were used to identify the target sample for qualitative analysis, making sure to capture equal rates of self-reported race (African American/White) and gender identity (Man/Woman). Rapid qualitative analysis (Hamilton, 2013; Hamilton & Finley, 2019; Taylor et al., 2018) was used to examine two separate domains: *Anticipated* changes and *Made* changes. Individual participant responses were organized by these two domains (which aligned with the two interview questions) into a matrix in MS Excel (Averill, 2002). The primary author (ALJ) was not involved in data collection and reviewed the responses for the first 10 participants and developed preliminary themes. The qualitative team (ALJ, TRS, MEP) then met in-person to develop an initial set of thematic codes. The qualitative team consisted of three professors with PhDs in clinical psychology and one health counselor, all with intimate and detailed knowledge on how to treat individuals trying to quit smoking; the health counselor involved in the study helped treat participants in this study, but was blinded to study participant identifiers when coding data. Two independent coders used these themes to code the data, with each coder coding each response. Participants' answers were permitted to receive codes for multiple themes. Regular consensus meetings were held between ALJ and the two coders to resolve any discrepancies in coding. Novel themes developed during coding were agreed upon by the smaller coding team (ALJ and the two coders), with a secondary level of consensus from the qualitative team halfway through the coding process. After coding, the prevalence of themes by demographic characteristics (race, gender, nicotine dependence, psychiatric comorbidity) was qualitatively reviewed to determine if potential differences existed by demographics.

Results:

Participants in the prequit cohort for the current study were 125 adults who smoked and were interested in quitting (48.8% female; 44.0% White; $M_{\text{age}} = 51.3$ years) in South Central and South Eastern Wisconsin. The post-quit cohort included 100 participants who completed the second interview as well as the first (50.0% female; 49.0% White; $M_{\text{age}} = 52.0$ years). Full demographic information is presented in Table 1.

Qualitative analyses of Domain 1 (*Anticipated* changes) revealed that 77 (61.6%) participants identified at least one change they need to make to quit smoking. The most commonly reported *Anticipated* change prequit was identifying triggers to smoke (with no mention of needing to develop a specific plan to cope with the trigger without smoking; Table 2). Common triggers included stress, the routine or habit of smoking, and urges to smoke. This was consistent across gender, race, psychiatric history, and nicotine dependence. Only 24 (36.9%) of those who identified a trigger also had a clear plan to deal with that trigger. Twenty-one participants reported needing to avoid others who smoke and needing to focus on the benefits of quitting, which were also components of cessation counseling. However, some evidence-based elements of smoking cessation treatment (Fiore et al., 2008) were the least reported *anticipated* changes reported prequit (e.g., use smoking cessation medications, reduce alcohol consumption, remove smoking cues from the home, elicit support from loved ones). Within the "Other" category in the *anticipated* changes domain were: the realization of needing help, although what type of change was not specified, and an increased desire/willingness to seek help during this cessation attempt.

There were no gender, dependence, or psychiatric comorbidity differences in endorsement of themes. However, compared to White participants, African American participants more commonly reported needing to avoid other people who smoke and needing to get their partner to quit (i.e., reduce exposure to social smoking cues). See Supplementary Table 4.

Table 3 shows the Domain 2 changes participants reported making post-target quit date. Novel themes participants identified after quitting that were not discussed prior to quitting included using the “4 D’s” of smoking cessation (Delay, Drink water, Deep breathing, Distract), changing their daily routine, and actually making no changes. The four changes participants most commonly reported making were using the “4 D’s” to cope with urges to smoke, reducing exposure to non-social smoking cues, focusing on the benefits of quitting (changing their mindset), and changing their daily routine. These themes were the most commonly reported across gender and nicotine dependence level, and were the most commonly reported by White participants and participants with no psychiatric history. African American participants also reported using the “4 D’s” and changing their mindset as some of the most commonly reported changes made, but they also reported avoiding friends who smoke and removing smoking cues as the other two most common changes (see Supplementary Table 5). Participants with a psychiatric disorder in the past year reported removing smoking cues less often than those with no past-year psychiatric diagnosis or treatment. Participants very rarely mentioned using cessation medication as a change they had made to help them quit.

Discussion:

To the best of our knowledge, this was the first study to qualitatively examine both the prospective changes adults who smoke believe they need to make to successfully quit and the changes they reported actually implementing. Rapid analytic methods identified 11 unique responses participants in a large comparative effectiveness smoking cessation trial gave when asked what they would need to do to successfully quit as well as 10 changes participants reporting making during the first 2 weeks of their quit attempts. However, over one-third of participants were not able identify a specific change they needed to make to be successful in quitting smoking. This lack of understanding of the role of behavioral change in the success of a subsequent quit attempt may be related to a lack of self-efficacy with respect to quitting and may be a target for intervention and future research (Elshatarat et al., 2016).

Among participants who were able to identify changes that needed to be made to support their cessation, it was clear that they were well aware of the dangers of prequit triggers and urges to smoke. This is important as urges have been shown to mediate cessation success (Bolt et al., 2012; McCarthy et al., 2008), and the ability to identify and plan for triggers and the cravings that may follow may facilitate successfully quitting (Fiore et al., 2008). While many participants were not initially able to identify specific mechanisms for coping with these triggers, participants were receptive to evidence-based strategies to deal with triggers suggested in the counseling, as evidenced by the novel themes they identified after the target quit date (e.g., use the 4 D’s to cope with urges to smoke; change daily routine). In fact, the four most common themes of changes made during the first 2 weeks post-quit (e.g., 4

D's, avoiding alcohol, getting social support, reducing exposure to smoking cues) were all taught during cessation counseling and are consistent with best-practice guidelines (Fiore et al., 2008).

In addition to behavioral changes, many participants reported needing to change their mindset and having changed their mindset to help them quit. While participants seem to place importance on changing their mindsets, previous research has suggested that verbal/cognitive changes are less important in achieving cessation success than in deciding to quit (DiClemente & Prochaska, 1982). Therefore, it may be helpful to address that while changing mindset is important, especially from participants' perspectives, this may not be sufficient for successful cessation. Future interventions and research may want to address adding behavioral changes to such cognitive changes to maximize cessation success.

The infrequency with which cessation medication was mentioned may highlight a need to provide additional education on the benefits of cessation medication. It is also possible that it did not occur to participants, who were all offered medication as part of the study, to consider mentioning medication as a "change" they made in their life to help them quit. The lack of reporting medication use in made changes may also reflect difficulties with adherence or limited awareness of how much cessation medication can increase the odds of successfully quitting.

Notably, participants did not differ in the content or prevalence of the needed or implemented changes they reported by gender or nicotine dependence level. There was, however, a unique pattern found among African American participants emphasizing the importance of social smoking cues before and after quitting, which may be related to a variety of socio-cultural differences, including environmental exposure to advertising and retail outlets (Asumda & Jordan, 2009; Lee et al., 2015; Siahpush et al., 2010; Yu et al., 2010), stressors or other factors. These findings are consistent with a study of 305 caregivers who smoke that found greater exposure to smoking in African American homes in comparison to the Latino and Non-Latino White homes (Fedele et al., 2016). Participants with a psychiatric history were less likely to report removing smoking cues from their home, which may provide insight into difficulties among this sub-population with achieving short-term cessation success (Johnson et al., 2020).

The findings of this study must be viewed with certain strengths and limitations in mind. For instance, while this was a brief qualitative study of patient insights, we did not have a way to determine whether changes identified prequit and post-quit were actually implemented during the cessation attempt. It could very well be that participants identified changes that they then did not implement. Although this study used qualitative methods, questions were created from the researchers', rather than the participants' perspective, and therefore may have constrained participants' possible responses. Future studies would benefit from in-depth qualitative interviews with adults who smoke from a patient perspective to help further explain the results of this study and to elucidate their thoughts surrounding the cessation process and behaviors patients feel would help them quit. Additionally, the study sampled was collected from an ongoing cessation trial. This brief collection of qualitative feedback in the context of an ongoing trial from the same group of researchers may have

produced a response bias in participants, particularly in the post-quit interview. Similarly, the limitation of the sample analyzed to those participating in a cessation treatment study limits generalizability to the smoking community as a whole.

Although participants were collected from an ongoing cessation trial, we purposefully sampled a large number of participants to allow for analysis of important subgroups based on various demographic characteristics to preliminarily examine whether differing demographic characteristics impacted perceptions. Nonetheless, future studies should conduct in-depth interviews with individuals of diverse backgrounds who are currently smoking and not engaging in a smoking cessation treatment trial. Lastly, while this study examined differences by gender and racial identity, groups were examined separately, gender options were presented as binary (limiting multiple expressions of gender identity), and the only racial groups examined were Black and White. Future studies are needed to further explore potential group differences in patient perspectives of needed and completed changes in a quit attempt, among a wider representation of races, gender identities, and sexual orientations. Future research should also address the intersectionality of these groups to understand how race, gender, and other identities interact and differentiate participants' experiences (i.e., perspectives of African American women compared to African American men).

Conclusions

Qualitative research can provide key insight into participants' experiences with the smoking cessation process. For instance, many participants did not identify a plan for change they needed to make prior to quitting smoking which may suggest limited feelings of cessation self-efficacy around quitting. However, the majority of participants identified a smoking trigger or barrier to quitting or a change that they intended to make to support their successful cessation. In addition, participants clearly retained and reported making behavioral changes taught during counseling, which may help explain why counseling is beneficial. Future treatments should focus on increasing patient understanding of the importance of making behavioral changes as well as understanding that using cessation medication is another key behavioral change that facilitates cessation success. African Americans who smoke may be particularly interested in reducing their exposure to social smoking cues while quitting, while people with a psychiatric history appear less likely to remove smoking cues from their home and could be encouraged to do so. While this study is a meaningful first step in this line of work, future in-depth qualitative research coupled quantitative analyses of cessation outcomes is needed to more fully examine the relation between reported changes made, actual implementation of said changes, and subsequent cessation success.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Baseline Demographics, Smoking History, and Psychiatric History by Group

Demographics	Pre-Quit Group (N = 125)	Post-Quit Group* (N = 100)
Age (yrs), M (SD)	51.30 (12.07)	51.98 (11.58)
Gender		
Men, n (%)	64 (51.2)	50 (50.0)
Women, n (%)	61 (48.8)	50 (50.0)
Education		
Grades 1–8, n (%)	3 (2.4)	1 (1.0)
Grades 9–11, n (%)	10 (8.0)	7 (7.0)
HS Degree or GED, n (%)	29 (23.2)	21 (21.0)
Some College, n (%)	61 (48.8)	54 (54.0)
4 or More Years of College, n (%)	22 (17.6)	17 (17.0)
Race (%)		
White, n (%)	55 (44.0)	49 (49.0)
African American, n (%)	68 (54.4)	50 (50.0)
Multiracial, n (%)	2 (1.6)	1 (1.0)
Smoking History		
CPD, M (SD)	13.82 (6.14)	14.13 (6.33)
High Nicotine Dependence, n (%)	108 (86.4)	85 (85.0)
Psychiatric History		
Past Year Psychiatric History, n (%)	24 (19.2)	21 (21.0)
Lifetime Psychiatric History, n (%)	42 (33.6)	35 (35.0)

Note. CPD = Cigarettes per day. High Nicotine Dependence: smoked within the first 30 minutes of the day as recorded on Item 1 of the Fagerström Test for Cigarette Dependence³¹.

*The Post-Quit Group is a smaller subset of the Pre-Quit Group.

Anticipated changes – Responses to: “What do you think you need to change about your life to quit smoking?”

Table 2.

Theme	Frequency	Illustrative Quotes
Identify smoking triggers (with no specific plan to cope with the trigger)	65 (52.0%)	<p>"I think it's just the nicotine urge, is what I need to go away."</p> <p>"Getting rid of the things that normally make me smoke, but part of that is driving in the car when I'm on a long drive, that's a big time."</p>
Change mindset/focus on the benefits of quitting	29 (23.2%)	<p>"...uhh there's really nothing to change but your attitude has to be 'okay enough is enough, it's time, just do it.'"</p> <p>"... I need to focus on the fact that, um, quitting smoking will ... financially put me in a better place...Health wise I know it'll put me in a better place too..."</p>
Reduce exposure to social smoking cues	21 (16.8%)	<p>"Change the environments that I go to cause a lot of people I know smoke ... if I don't go outside and hang out with everyone, just stay inside it'll help me."</p> <p>"...I guess, limit my company that smokes, is not a good source, but be around less people that smokes."</p>
Make other health changes	17 (13.6%)	<p>"Probably be more active, I would have to become more active, exercise definitely more of that."</p> <p>"...and whether that's healthy eating, going to the gym more you know..."</p>
Reduce exposure to non-social smoking paraphernalia/cues	11 (8.8%)	<p>"First of all I think I need to make sure there's no cigarettes in the home, no ashtrays, none of that."</p> <p>"Stop going to the store to buy cigarettes."</p>
Change alcohol consumption	10 (8.0%)	<p>"Well, I mean, I smoke more when I drink. So I mean right now I am trying to cut back on the drinking and eventually I do want to quit drinking too..."</p> <p>"... I'm going to have to change a lot, um everything from drinking coffee in the morning to stop alcohol..."</p>
Other	10 (8.0%)	<p>"Um, nothing really, cause I need some help, I can't do it by myself."</p> <p>"...I'm ready to quit, but doing it on my own doesn't work so."</p>
Get support from friends and loved ones	3 (2.4%)	<p>"... I think I just need the support of my family is the biggest thing ..."</p> <p>"... I have a lot of support at work..."</p>
Identify plan to deal with stress	2 (1.6%)	<p>"Um, some of my stressors. I started making some changes like I said, like going outside ..."</p>
Use study medication	2 (1.6%)	<p>"... That's why I want the Chantix and the patches cause maybe they alleviate that urge, that sensation that I have ..."</p> <p>"...The drugs will help..."</p>
I don't know	2 (1.6%)	<p>"To quit smoking, um, I'm not really sure ... I really don't know..."</p>

Changes made – Responses to: “What have you changed in your life to help you quit smoking or stay quit?”

Table 3.

Theme	Frequency	Illustrative Quote
<i>Used the 4 D's to cope with urges to smoke (Delay, Drink water, Deep breathing, Distract)</i>	32 (32%)	<p>“... just keep busy like reading, drinking a lot of water during the day that helps a lot. Taking deep breaths really works, that's a good one ...”</p> <p>“I have been going for lots of walks and I have been doing a lot of deep breathing. I drink a lot water as it is, but I've been drinking lots of water.”</p>
Reduced exposure to non-social smoking paraphernalia/cues	28 (28%)	<p>“... I just got rid of everything, the ashtrays, cleaned out my car completely you know, detailed the whole thing inside ... to get the smell out ...”</p> <p>“... make sure I don't buy cigarettes. If I have to get gas I go to a different gas station...”</p>
Changed mindset/focused on the benefits of quitting	25 (25%)	<p>“Um, I guess the mindset, um, it's like, I want to do this, um, I really wanna do it, it was like ... I'm doing it.”</p> <p>“... Um, and trying to change my attitude about it, or at least trying to um, I've been reminding myself, um ... that I um, enjoy being able to do things um, physical activity...”</p>
<i>Changed daily routine</i>	18 (18%)	<p>“Well I started to quit on a ..., during a time frame where I wouldn't be doing any normal things, it was out of my normal routine so, that helps a lot...”</p> <p>“Trying to change routines. There not all changed, but trying ... I guess mostly at home now, bed time, getting up.”</p>
Made other health changes	16 (16%)	<p>“... Um, eating better, healthier at least, um hitting the gym, got no choice there. I ride a hog, I don't want to look like one...”</p> <p>“... I've just tried to stay active...”</p>
Reduced exposure to social smoking cues	14 (14%)	<p>“Stopped playing cards on Sunday around the fellas.”</p> <p>“Um, I haven't really gone out very much the last two weeks, just cause I was afraid that if I did I would be around people who smoke ...”</p>
<i>No changes made</i>	11 (11%)	<p>“Nothing ... no I haven't changed anything.”</p> <p>“I don't think I've changed anything...”</p>
Got support from friends and loved ones	8 (8%)	<p>“... ah there's family and friends who know I'm trying to quit so I mean they've been supportive and trying to stay supportive...”</p> <p>“Not much I guess, just talking to my wife a lot, cause she wants me off of it...”</p>
Other	4 (4%)	<p>“Just not smoke [laughing] ... yeah, mmm.”</p>
Changed alcohol consumption	4 (4%)	<p>“Stopped drinking.”</p>
Identified plan to deal with stress	2 (2%)	<p>“... I've been working on coping strategies um for situations where you feel like distress and stuff ... I've been working on those with my therapist ...”</p>
Used study medication	1 (1%)	<p>“Nothing really, taking the medication and the patches.”</p>

Italics represent novel themes that were not identified in the interviews prior to quitting.