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Formative Evaluation of a Practice-Based Smoking Cessation Program for Diverse Populations

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Abstract

Background—Smoking rates are higher among those living at or below poverty and among persons with lower levels of education. We report on a formative research project examining patient perceptions of tobacco cessation strategies among diverse, low socioeconomic, urban smokers cared for in community-based primary care medical offices.

Method—We conducted 10 focus groups among low socioeconomic status participants recruited from urban primary care medical offices in Buffalo and Niagara Falls, New York. Participants included current or former smokers, who were stratified by age-group (18–39 years and 40+ years). The focus groups discussed perceptions of tobacco cessation strategies, previous quit attempts, and use/attitudes regarding technology and social media as potential platforms for cessation support.

Results—Participants ($n = 96$) included predominantly African Americans ($n = 62$, 65%) and European Americans ($n = 16$, 16%); 56% were older than 40 years and 92% were low income. Most participants were supportive of cessation message delivery via phone; however, the age-groups varied in their attitudes on quitting smoking, desired frequency of phone contacts, and social media usage. Participants aged 18 to 39 years reported more Internet use, greater use of text messaging, and were more open to health information via social media.

Conclusions—Based on significant variation between younger and older smokers' perceptions of tobacco addiction and use of communication technologies, it appears reasonable to stratify the content and platform of health messaging by the target age-group.

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Authors' Note

The content is expressly the opinion of the authors.

Declaration of Conflicting Interests

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Keywords

evaluation; focus groups; formative evaluation; health behavior; health promotion; media; qualitative methods; smoking and tobacco use; social media

Smoking is associated with a broad array of health outcomes and remains the leading preventable cause of cancer and premature death in the United States (U.S. Department of Health and Human Services, 2010). Annually, nearly 450,000 premature deaths are linked to tobacco use. Although overall rates of tobacco use have demonstrated a gradual decline since the 1970s, it has plateaued in recent years and the reduction in smoking rates has not been consistent among all population subgroups (King, Dube, Kaufmann, Shaw, & Pechacek, 2011). Despite similar rates of smoking compared with European Americans, African Americans tend to smoke fewer cigarettes yet have a higher incidence and mortality rates of lung cancer compared with their European American or Hispanic counterparts making improvements in effective smoking cessation among urban African Americans a major public health concern (Centers for Disease Control and Prevention, 2012; Haiman et al., 2006; Slopen et al., 2012).

As of 2010, although the smoking rate in the United States for adults was 19%, groups with lower levels of education and poverty continue to have higher smoking rates (King et al., 2011; Murphy, de Moreno, Cummings, Hyland, & Mahoney, 2010). Low socioeconomic status (SES) is closely linked with poorer health outcomes and disparities in smoking rates are an important contributor to this. (Cokkinides, Halpern, Barbeau, Ward, & Thun, 2008). Smoking rates for those below poverty level are 28.9% compared with 18.3% for persons at or above the poverty level (King et al., 2011). Furthermore, Medicaid populations are more than twice as likely to smoke as the general population (Murphy, Mahoney, Cummings, Hyland, & Lawvere, 2005).

Currently, automated systems are used to monitor and manage chronic disease. These automated systems have been referred to as both automated voice response (AVR) and interactive voice response systems (Finkelstein & Friedman, 2000). AVR technology is used in other common business venues such as banking, credit card companies, and household utilities. AVR systems focusing on health include computer software and a telephone system where patients are called at specified times and intervals. A voice asks questions and/or delivers instructions, whereas respondents provide verbal or keypad responses. AVR programs have been successful across the age continuum and with individuals having low technology and literacy skills (Piette, McPhee, Weinberger, Mah, & Kraemer, 1999). For example, AVR-based management of diabetic patients identified improvements in self-care, fewer symptoms, increased self-efficacy, and greater satisfaction by patients (Piette, 2000; Piette et al., 1999; Piette, Weinberger, & McPhee, 2000). Based on publications to date, AVR systems are acceptable for patients and represent an effective strategy for monitoring selected clinical indicators of chronic disease. Therefore, AVR systems provide a means to educate and support patients while communicating strategies for positive changes in health behavior including nicotine dependence. Unfortunately, there have been few evaluations of the impact of AVR systems on clinical or behavioral outcomes.

Integrating AVR technology into smoking cessation programs in primary care medical settings offers potential to improve quit rates. One pilot study involved 99 smokers hospitalized with coronary heart disease. Patients were randomized to either usual care consisting of brief counseling and nicotine replacement therapy or an AVR group receiving automated telephone follow-up calls at 3, 14, and 30 days after discharge, in addition to usual care. After adjusting for education, age, reason, and length of hospitalization, and quit attempts in the past year, the odds of quitting in the AVR group were greater compared with the usual care group (odds ratio = 2.34, 95% confidence interval = [0.92, 5.92]; $p = .07$; Reid, Pipe, Quinlan, & Oda, 2007). This suggests that an AVR system may be an effective intervention for addressing tobacco dependence.

This article reports findings from formative research to develop and tailor the use of AVR for health messaging among diverse patients served by multiple clinical primary care practices in Western New York State. This is the first phase of a larger intervention study to test the comparative effectiveness of cessation messages using advanced communications technologies such as AVR to more effectively promote smoking cessation in community settings compared with standard cessation messages delivered during office visits. The objectives of this study were to review social and cultural perspectives of smoking among low-SES populations, to identify effective communication channels for reaching this population with cessation messages, and to develop smoking cessation messaging for the AVR process.

Method

This is a community-based study in collaboration with five primary care medical offices and academic investigators at a university and a cancer center in the New York State area. Practice site selection was based on location in predominately medically underserved, African American communities in the cities of Buffalo and Niagara Falls, New York. The study was approved by the cancer center's institutional review board.

Participants and Procedures

Participants included both current and former smokers recruited by clinic staff and flyers posted in practice and surrounding community. Focus group participants were 18 years or older and were predominantly African American. We stratified focus groups by age (18–39 years old and 40 years and older) to examine potential age-related differences in use of information and communication technologies.

Between March 2011 and August 2012, we conducted 10 focus groups consisting of 96 participants in urban, medically underserved locations in Buffalo (6 groups) and Niagara Falls (4 groups). Four focus groups were conducted for participants' aged 18 to 39 years and six focus groups were conducted with the 40+ age-group. Experienced project staff moderated focus group meetings using a structured set of questions (Table 1); each session was audiotaped and lasted 45 to 60 minutes. Focus groups participants, who were recruited from community centers and/or medical offices, provided consent and were given a \$30 gift card at the conclusion of each session.

Each session started with close-ended demographic and smoking history questions. Questions were displayed on PowerPoint slides and read aloud with participants responding anonymously using wireless keypads. This technology, known as the audience response system, is an effective research and education tool for compiling data among low-literacy populations (Sudarsan, Jandorf, & Erwin, 2011). Focus group discussion topics included access to media/ technology, use of social media, experiences with automated call technology, and quit attempts and preferences for tobacco cessation messaging (see Table 1).

Data and Text Analysis

Audience response system responses to the quantitative questions were downloaded into Excel, then SPSS (Version 16.0, SPSS Inc., Chicago, IL) was used to facilitate descriptive analyses. Audio recordings of the focus groups were transcribed verbatim by project staff and entered into QSR NVivo 8 qualitative software (QSR International, Victoria, Australia). Four independent coders reviewed and coded text for thematic content. Themes arose from the compilation of categorical terms each coder identified from comments and sections of the transcribed text. Depending on the frequency and applicability to the PEN-3 model (see below) these themes were broken into specific subcategories (Table 2). If a comment reflected a theme that only occurred from one respondent, it was considered nonrepresentative and was not reflected in the analysis.

The PEN-3 Model (Airhihenbuwa & Webster, 2004) was the framework that guided the interpretation and analysis of the textual content of the qualitative data. This model is an effective analysis for sorting and contextualizing qualitative findings into meaningful domains to inform behavioral interventions (Erwin et al., 2010). This analytic process involves categorizations of focus group responses and resulting thematic content into how they may affect desired (i.e., tobacco cessation) and/ or problematic (i.e., tobacco addiction and use) behaviors. For example, representative themes and responses are categorized as Perceptions, Enablers, or Nurturers as they relate to tobacco cessation. We further categorized Positive, Existential, or Negative influences on the identified behaviors.

Results

Frequency of responses by age-group demonstrates one level of variation between the younger and older participants. There were 126 responses in the 40+-year-old group (6 total sessions) regarding using AVR technology compared with 53 by the younger focus group participants (4 total sessions). Likewise, the older participants offered many more comments regarding challenges and approaches to cessation than the younger participants (105 vs. 26) and were particularly interested in the needs and process of cessation attempts and their perceptions of smoking.

Demographic Characteristics

Of the 96 participants attending the focus groups, 79% were current smokers (82% of 18–39-year-olds and 77% of participants 40 years and older). As shown in Table 3, the majority of the participants were female (61%), with 65% identifying as African American, 17% as

European American, and 9% as mixed or other ethnicity/race. Nearly half of the participants were older than 40 years, never married; indicated that they were disabled and not working; 48% of participants reported education levels of high school or less; 61% had Medicare or Medicaid health insurance; and 85% stated household incomes of \$30,000 or less. The age groups differed on marital status ($p = .006$) and education ($p = .002$; see Table 3).

Quantitative Responses

Overall, 92% of focus group participants owned a mobile phone and 80% used it more frequently than their landline. Sixty-eight percent of respondents send text messages and about two thirds (65%) prefer it to telephone calls for health messaging; 48% liked the idea of receiving prerecorded cessation messages. As shown in Table 4, compared with their counterparts, participants 18 to 39 years old reported more Internet use, greater use of text messaging, and openness to receiving health information via social media.

Qualitative Responses

The focus group process revealed notable discrepancies by age group in overall interest as well as recognition of the difficulty in cessation. Younger participants seemed less concerned and even dismissive of cessation challenges. There was also more fluency of discussion about tobacco use, and the cessation process by older participants. For instance, participants aged 40 years and older showed more interest, offering more responses and longer discussions throughout the focus groups. Older participants were particularly interested in the challenges of cessation, the needs and process of cessation attempts, smoking perceptions, and quitting experiences compared with younger participants. Below are examples of comments categorized as “Challenges and Approaches to quitting” from participants 40 years and older:

I know it's crazy, especially when you're medically ill and know that smoking is not healthy. When am I gonna stop? When someone says you have cancer or something?

It's like crack. It's just like crack. It's hard to come away from the cigarettes. I quit smoking for 3 years.... I'm not doing it for the taste because if I can get to the reservation and buy a carton for 20 dollars, I don't know what one cigarette tastes from a different cigarette. I really don't. I just wanna quit. I've tried to quit several times, but it's like crack. It keeps calling me.

Comments on this theme from participants 18 to 39 years of age included

Personally, if you're gonna smoke, you're gonna smoke. It don't matter what's on the cigarette pack or cuz they show the commercials. And if you put it on the cigarette, it's still not gonna matter.

Most people get cancer if they don't smoke, so what's the difference?

The older group contributed more material for creating a smoking cessation intervention. Younger participants (aged 18–39 years) offered brief responses regarding tobacco use and cessation, and demonstrated fewer cessation challenges in their responses. Examples of comments about cessation pharmacotherapy from participants 40 years and older:

I tried the patch. The doctor said I can't use the patch because my blood pressure was too high, so Chantix was great. I didn't smoke for 6 months, but there's a side effect. You get heart palpitations that are not good ...

I tried the Chantix and the first week, when you could smoke with it that was fine. The second week when you couldn't smoke that's when I had breathing problems. Couldn't breathe.

Comments from participants 18 to 39 years old:

I've been on Chantix. My dentist gave me Chantix. I just, I still smoked while taking the Chantix, but I figured what I did need was to do something with my hands. It's just a habit.

... the Chantix works really, really well. If there was some way that you guys could help with the nausea associated with the Chantix, I know I would have been successful on that Chantix.

We observed greater comparability between groups regarding topics of technology use (e.g., text messaging and social media). For example, both groups noted use of Facebook and text messaging. There were 13 and 14 responses, respectively, from the 18- to 39-year-old and 40+-year-old participants about use of social media. There were 16 negative responses about automated voice messaging by younger participants and 23 negative responses by older participants.

Textual analysis of the symbolic and structural role of the comments and themes provided enhanced data for application to our AVR technology intervention. Table 5 reflects the 3 × 3 analysis of the themes within the PEN-3 domains to reflect the impact of responses on various experiences and behaviors by age cohort. For example, responses within "Successful Quitting Approaches" and "Health Issues" suggest personal knowledge and experiences with tobacco use and quitting as positively influencing cessation. Responses within the theme "Tobacco and Smoking Replacements/Quitline" were categorized as "Enablers" which is defined by the PEN-3 Model as external factors influencing behavior including societal or structural influences (Airhihenbuwa, DiClemente, Wingood, & Lowe, 1992).

Business practices and the sale of tobacco are identified as promoting the use of tobacco. As one respondent stated, "... if my brand of tobacco is not readily accessible I would quit." This leads us to conclude that the availability of tobacco, especially inexpensive products, promotes smoking and hinders quit attempts and is a potentially "Positive/Enabler" as evidenced by the following comment:

I think for me, if they stop selling my brand of cigarettes it would help me, for real. I really don't think I would smoke no more. Further, the sale of single cigarettes may not act as a cost saving measure in the long term.

As one participant pointed out, "I buy what they call 'loosies.' I spend more money paying for the loosies' than I did the \$7 pack, you know what I'm sayin'?" This is categorized as "Negative/Enabler" that may be specific to the urban, low-income cultural/societal system and operates to promote continuation of the individual's smoking habits.

Quitting Challenges and Approaches are themes that were analyzed within both categories of “Perceptions/Negative” and “Enablers/Negative.” Reported experiences of failed quit attempts and poor outcomes with the Quitline resource are based on individual knowledge and experience within the domain of “Perceptions.” Societal and structured challenges are “Enablers” because they link to time of day, drinking and bar behaviors, and other “trigger” experiences within the social context of participants’ lives. Themes related to factors about participants’ children, grandchildren, and cancer deaths in the family are often reported as positive influences to cessation. These are considered “Nurturers” because they reinforce cessation through the importance of relationships. For example, participants commented about the value of playing with their grandchildren, and tobacco-related physical disabilities served as a positive influence in recognizing a need to quit. Likewise, the loss of family members due to cancer can be cues for cessation behaviors. These concepts are demonstrated in the following statements: “... grandkids—I try to chase them around, you know if I pass out, you know it’s time to stop,” and “I had a lot of family members that died of cancer so that’s another thing. It was just a lot of different things that made me just decide that maybe I need to quit.”

In the “Negative/Nurturer” category, many individuals reported starting or continued smoking because of the activities of parents or other family members. Family members who smoke are seen as role models affirming that smoking is acceptable. As one respondent stated, “I started from my parents;” and “... I ran to my daughter’s room—‘give me a cigarette, honey!’ Took two puffs and then you get right on out, been smoking ever since.”

Comments about the Quitline, pharmaceutical/clinical support and comments about AVR messages were analyzed within the enabler domains as they are part of the social and systematic infrastructure. Participant responses about these themes were categorized as both positive and negative: For instance, one response included “You know, the strangest thing though, I smoked for over 40 years and no doctor ever told me, ‘you need to quit smoking,’” demonstrating that the medical system may not have acted as a positive influence for cessation for this participant. However, not all respondents reported similar experiences with their health care providers.

For both age-groups, the Quitline had more positive responses than negative or problem-related comments (19 positive vs. 8 negative). “Yeah, they are helpful.... because that is how I received the lozenges through the Quitline.” However, regarding experiences with the Quitline not offering nicotine replacement patches for more than 2 weeks, “... I mean, if they gonna start it, they may as well finish it to the end as far as I’m concerned ...” Regarding specific AVR messages and what participants do and do not want to hear as recorded messages, there were several comments that suggest that smokers do not want to be criticized for their habit: “No criticizing. Criticizing don’t make people do nothing,” “Maybe something encouraging like ‘what you’re doing is good for you. Keep it up. You’re worth it’ ...” Likewise, some of the older participants suggested the following messaging through phones and social media such as Facebook: “I would like it [AVR on their phone] as opposed to literature, it’s more modern”; “[send] health messages”; “I think the testimonies of other people would help”; “A little support, something like have you smoked today? If

you haven't, try not to. Just basically like you need to stop and you need somebody to help you along when you're not smoking to continue not to smoke."

The largest number of AVR-related comments regarded message content (19 from the younger group and 32 from the older than 40+ years group), including suggestions for calls to originate and identify as coming from a doctor's office, and include positive-themed messages, health benefits, and potential savings resulting from cessation. Comments about experiences with use of AVR were generally negative for both age groups (39 negative vs. 15 positive) due to use by bill collection companies and solicitations.

Discussion

Responses from this formative research indicate that mobile phones represent a preferred technology platform for communicating health messages to low-SES urban community members. Our results demonstrate that nearly all focus group participants reported owning a mobile phone and 68% use text messaging. Also, nearly one half were receptive to receiving prerecorded cessation messages if they were from a doctor's office. While younger persons reported greater access to and use of technology/ social media, outlets such as Facebook, may represent potential platforms for delivering health education and messaging to low-SES minority populations. These findings suggest that low-income urban populations use and access communication technology and social media. Our research also demonstrated that web-based messaging may be less accessible to a proportion of low-SES urban community members given limited access to both computer hardware and Internet connections; however, this may be counterbalanced by Internet-enabled phones.

One unique aspect of this research was that the regions selected for inclusion represent high-risk communities. U.S. Census data indicate that 88% of the 123,529 African Americans in Erie County reside in the City of Buffalo (U.S. Census Bureau, 2010). Moreover, Buffalo (2010 population of 292,648) is the third poorest city of its size in the United States, with 28.5% of residents below the poverty level; the proportion of residents aged 25 years and older with less than a high school degree is 17.7% in Buffalo and 10.4% in Erie County (U.S. Census Bureau, 2010).

This formative research demonstrated that smokers older than 40 years are interested in cessation products and resources, and self-identify as they are affected physically with more health effects from tobacco use. Furthermore, they recognize the challenges of tobacco cessation. These findings also suggest that the digital and technology divisions of the use and ownership of personal computers and Internet access by higher SES and younger residents, is not necessarily reflected in cell phone use which is more universal. These findings also suggest that the sociocultural segmentation related to use/ownership of personal computers and Internet access does not necessarily extend to cell phone use.

Although clinician encouragement can be an important motivator, data from 2010 suggest that only about one half of clinicians were encouraging smokers to quit (Kruger, Shaw, Kahenda, & Frank, 2012). Moreover, males, persons aged 18 to 24 years, Hispanics, and the uninsured were less likely to reported having received advice to quit smoking from their

health care professional (Kruger et al., 2012). Additionally, both African American and Hispanic smokers are less likely to use smoking cessation aids to increase their odds of quitting successfully (Cokkinides et al., 2008). Evidence-based recommendations encourage clinicians to prescribe effective medications (e.g., nicotine replacement therapy, bupropion, or varenicline) in combination with behavioral support to optimize quit rates among smokers committed to quitting (Fiore, 2008). However, the first step in addressing cessation in medical settings involves the systematic identification of smokers, followed by the delivery of quitting assistance (Fiore, 2008; Land et al., 2012).

Formative research is infrequently used in the context of developing programs/interventions to promote smoking cessation. One study used this methodology to assess which components of a cessation program were preferred by smokers; however, that research was done well prior to the present explosion of Internet-enabled cell phones (Spath, 1991). Interestingly, respondents to that earlier study endorsed a cessation program which was not burdensome in terms of time, was designed based on published research and recommendations from physicians, and included relaxation exercises and tips to avoid weight gain, which has a number of parallels to our findings (see Table 5). The PEN-3 analysis and categorizations suggest that there are approaches that may be promoted via AVR messaging to encourage cessation. These include identifying the support of family members or significant others, having clinicians more involved in asking about tobacco use and promoting cessation, especially when patients have health concerns or symptoms, and the use of positive messages. Although the Quitline is often perceived as helpful, many smokers report needing additional resources and pharmacotherapy, as well as referrals to medical homes for further assistance.

Limitations of this research project include its specific focus on underserved, low-SES urban adults in a defined geographic region who agreed to discuss their perceptions and experiences about smoking cessation and use of technology and social media. However, this effort was essential to yield information about development of cessation messages and platforms for dissemination.

Conclusion

Mobile phones represent an acceptable technology for communicating health messages to low-SES urban community members in this area of New York State. A surprisingly high proportion of participants reported owning a cellular phone, more than two thirds reported using text messaging, and nearly one half noted that they were receptive to receiving prerecorded messages about quitting smoking from a doctor's office. However, we also noted some variation between younger and older smokers' perceptions of tobacco addiction and use of communication technologies, suggesting that it may be important to stratify the content and platform of health messaging by the target group. Future research will determine the effectiveness of the cessation messaging and the implementation of the AVR intervention through a community-based participatory research process, and will measure the positive impact of this intervention on tobacco cessation for patients in these primary care offices.

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Table 1**Focus Group Topical Questions for Discussion.**

Media/technology	
Q1	Do you have a desktop computer and/or a laptop in your home?
Q2	Do you use the Internet?
Q3	Do you have a mobile phone?
Q4	Do you have a landline phone?
Q5	Which one do you use more frequently?(mobile or landline)
Q6	Do you text message? How often do you text message?
Q7	Do you use instant messaging? How often do you instant message?
Social media	
Q8	Which social media outlet do you use more often? (Twitter, Facebook, MySpace, Other)
Q9	How do you access all social media? (mobile phone, desktop, laptop)
Q10	Would you be comfortable receiving health messages using social media?
Automated call technology	
Q11	Have you ever called somewhere and had an automated voice answer?
Q12	Has anyone ever received a call where a computer has called your phone?
Tobacco cessation messaging	
Q13	What do you think of the idea of a computer calling you with tips to quit smoking?
Q14	How often do you think you would like to be called?
Q15	Whose voice would you like to receive the messages from? (doctor, nurse, counselor)
Q16	Would you like the idea of your doctor sending you prerecorded messages about quitting smoking and tips on how to do so?
Q17	Would you like these calls to come to your mobile device or landline?
Q18	Where would you like to receive a message about quitting smoking? (mobile, e-mail, social media, other)
Q19	What time of day would you like to receive these messages? (morning, lunchtime, afternoon, evening)

Table 2

Focus Group Qualitative Themes: Frequencies by Age-Group.

	Age 18–39 Years (No. of Responses)	Age 40+ Years (No. of Responses)
1. Nicotine replacement	20	29
a. Problems	5	16
b. Drug side effects	3	8
c. Effectiveness	11	5
2. Quitting challenges and approaches	26	105
a. Reasons to quit	7	21
b. Advantages	1	7
c. Symptoms	1	7
d. Attitudes regarding smoking	8	23
e. Approaches	6	16
f. Problems and challenges	2	28
g. Attempts	4	9
3. Where to find resources for quitting	17	22
4. Tobacco and smoking replacements	2	10
5. Quitline	20	22
a. Positive perceptions	10	9
b. Negative perceptions and problems	2	6
c. Marketing and advertising	4	4
6. Specific help and tailored assistance	5	18
a. Captive to tobacco (examples)	1	3
b. Beliefs and culture of smoking	4	13
7. Use of Internet	12	20
8. Use of text and messaging	13	20
9. Use of social media	13	14
10. Automated voice recognition	53	126
a. Negative responses and problems	16	23
b. Positive responses and experiences	4	11
c. Frequency	1	9
d. Source of voice	7	14
e. Preferred phone	1	4
f. Instrument, tool, or medium	3	3
g. Time of day	2	12
h. Message content	19	32
i. Prior experience with automated voice response	7	17
j. Neutral responses	0	3
11. Stress	1	1
12. Addiction and examples	1	1

Note. Numbers in columns signify the number of references/quotes under each category.

Table 3

Demographic Summary of Focus Group Participants by Age-Group.

Variables	Age-Group		Total (<i>n</i> = 10 Groups, 96 Participants);	<i>p</i>
	18–39 Years (<i>n</i> = 4 Groups, 44 Participants);	40+ Years (<i>n</i> = 6 Groups, 52 Participants);		
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Attendees				
Buffalo	33 (75)	35 (67)	54 (56)	.501
Niagara Falls	11 (25)	17 (33)	16 (17)	
Gender				
Male	10 (23)	18 (35)	28 (29)	.359
Female	28 (64)	31 (60)	59 (61)	
No response provided	6 (14)	3 (6)	9 (10)	
Race/ethnicity				
European American	7 (16)	9 (17)	16 (17)	.424
African American	27 (61)	35 (67)	62 (65)	
Hispanic	2 (5)	—	2 (2)	
Mixed/other	2 (5)	5 (10)	7 (7)	
No response provided	6 (14)	3 (6)	9 (8)	
Age in years				
18–30	24 (55)	—	24 (25)	<.001
31–39	13 (30)	—	13 (14)	
40–50	—	22 (42)	22 (23)	
51–60	—	17 (33)	17 (18)	
61–69	—	7 (13)	7 (7)	
70+	—	1 (2)	1 (1)	
No response provided	7 (16)	5 (10)	12 (13)	
Marital status				
Married/partnered	5 (11)	11 (21)	16 (17)	.006
Divorced	1 (2)	10 (19)	11 (11)	
Widowed	1 (2)	5 (10)	6 (6)	
Separated	2 (5)	5 (10)	7 (7)	
Never married	29 (66)	19 (37)	48 (50)	
No response provided	6 (14)	2 (4)	8 (8)	
Education				
Less than high school	11 (25)	10 (19)	21 (22)	.001
High school graduate/GED	17 (39)	8 (15)	25 (26)	
Some college/technical school	10 (23)	21 (40)	31 (32)	
College graduate	—	11 (21)	11 (11)	
No response provided	6 (14)	2 (4)	8 (8)	
Health insurance				
Medicare	12 (27)	15 (29)	27 (28)	.118
Medicaid/managed care	13 (30)	19 (37)	32 (33)	

Variables	Age-Group			<i>p</i>
	18–39 Years (<i>n</i> = 4 Groups, 44 Participants);	40+ Years (<i>n</i> = 6 Groups, 52 Participants);	Total (<i>n</i> = 10 Groups, 96 Participants);	
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Private	1 (2)	10 (19)	11 (11)	
No insurance	6 (14)	3 (6)	4 (4)	
Family Health Plus	2 (5%)	2 (4)	2 (2)	
Other	4 (9)	2 (4)	6 (6)	
No response provided	6 (14)	1 (2)	7 (7)	
Household income in \$				
<5,000	19 (43)	10 (19)	29 (30)	.063
5,000–15,000	11 (25)	20 (38)	31 (32)	
15,001–30,000	6 (14)	16 (31)	22 (23)	
30,001–45,000	2 (5)	3 (6)	5 (5)	
45,001–60,000	—	1 (2)	1 (1)	
>60,000	—	1 (2)	1 (1)	
No response provided	6 (14)	1 (2)	7 (7)	
Employment				
Full-time	7 (16)	10 (19)	17 (18)	.229
Part-time	7 (16)	6 (12)	13 (14)	
Looking for work	9 (20)	5 (10)	14 (15)	
Disability	15 (34)	28 (54)	43 (45)	
Going to school	1 (2)	—	1 (1)	
Full-time homemaker	1 (2)	1 (2)	2 (2)	
Retired		2 (4)	2 (2)	
No response provided	4 (9)		4 (4)	
Smoking status				
Current	36 (82)	40 (77)	76 (79)	.101
Former	4 (9)	12 (23)	16 (17)	
No response provided	4 (9)	—	4 (4)	

Table 4

Reported Use of Social Media and Technology Among Focus Group Participants by Age-Group.

	18–39 Years (%)	40+ Years (%)	<i>p</i>
Use Internet	84	56	.004
Have mobile phone	93	90	.645
Use texting	79	60	.042
Use instant messaging	51	35	.104
Use Facebook	51	33	.192
Open to health information via social media	42	69	.028
Use phone for social media	26	20	.507

Note. Forty-four percent of younger adults and 63% of older adults ($p = .019$) reported no use of social media such as Twitter, Facebook, MySpace, or similar sites.

Table 5

Focus Group Qualitative Themes Analyzed Based on PEN-3 Model Domains, Stratified by Age-Group.

Domains	Positive Influence on Cessation or Not Using Tobacco (Frequency of Responses)	Existential (Neither Positive or Negative; May Be Culturally Specific) (Frequency of Responses)	Negative Influence on Cessation or Promotion of Tobacco Use (Frequency of Responses)
Perceptions (Knowledge and experiences with tobacco use and cessation resources)			
Perceptions: Most common to 18-to-39-year-old age group (<i>n</i> = 44)	Health issues (7) <ul style="list-style-type: none"> • Pregnancy Successful reasons to quit (7) Approaches to quitting (6)	Where to find resources for quitting (17)	Nicotine replacement (20) <ul style="list-style-type: none"> • Problems (5) • Drug-side effects (3) • Lack of effectiveness (11) Quitting challenges <ul style="list-style-type: none"> • Failed attempts (4) • Poor experiences with Quitline (2) • Attitudes regarding smoking (8) Need for help and tailored assistance (5) <ul style="list-style-type: none"> • Beliefs and culture of smoking (4)
Perceptions: Most common to 40+ year-old age group (<i>n</i> = 52)	Health issues (11) <ul style="list-style-type: none"> • Asthma • Can't breathe • Coughing Successful reasons to quit (21) <ul style="list-style-type: none"> • Advantages (7) • Symptoms (7) Approaches for quitting (16)	Where to find resources for quitting (22)	Nicotine replacement (29) <ul style="list-style-type: none"> • Problems (16) • Drug side effects (8) • Lack of effectiveness (5) Quitting challenges <ul style="list-style-type: none"> • Failed attempts (9) • Poor experiences with Quitline (6) Need for help and tailored assistance (18) <ul style="list-style-type: none"> • "Slave to tobacco" (3) • Beliefs and culture of smoking (13)
Enablers (Societal, systematic, or structured influences or forces that may enhance or create barriers to tobacco use and cessation)			
Enablers: Most common to 18- to 39-year-old age-group (<i>n</i> = 44)	Successful quitting approaches <ul style="list-style-type: none"> • Quitline (10) • Pharmacology resources through providers and Quitline (3) Quitline <ul style="list-style-type: none"> • Positive perceptions (10) Cost/expense of tobacco products Automated voice recognition (53) <ul style="list-style-type: none"> • Positive responses and experiences (4) • Message content (19) 	Where to find resources for quitting; smoking replacements (2) Quitline <ul style="list-style-type: none"> • Marketing and advertising (4) Use of Internet (12) Use of text and messaging (13) Use of social media (13)	Quitting challenges <ul style="list-style-type: none"> • Triggers to smoking (drinking, time of day, other behaviors) (2) Tobacco and smoking replacements (2) Quitline <ul style="list-style-type: none"> • May not meet individual needs (1) Automated voice recognition (53) <ul style="list-style-type: none"> • Negative responses and problems (16) • Prior experience with automated voice response (7)

Domains	Positive Influence on Cessation or Not Using Tobacco (Frequency of Responses)	Existential (Neither Positive or Negative; May Be Culturally Specific) (Frequency of Responses)	Negative Influence on Cessation or Promotion of Tobacco Use (Frequency of Responses)
	<ul style="list-style-type: none"> Time of day (2) 		
Enablers: Most common to 40+-year-old age-group (n = 52)	Successful quitting approaches (11) Quitline (9) <ul style="list-style-type: none"> Pharmacology resources through providers and Quitline (2) Quitline <ul style="list-style-type: none"> Positive perceptions (9) Cost/expense of tobacco products (5) Automated voice recognition (126) <ul style="list-style-type: none"> Positive responses and experiences (11) Positive message content (32) Time of day (12) Everyone uses mobile phones 	Where to find resources for quitting; smoking replacements (10) Quitlines <ul style="list-style-type: none"> Marketing and advertising(4) Use of Internet (20) Use of text and messaging (20) Use of social media (14)	Quitting challenges <ul style="list-style-type: none"> Triggers to smoking (drinking, time of day, other behaviors) (5) Tobacco and smoking replacements (10) Quitline <ul style="list-style-type: none"> Negative perceptions and problems (6) May not meet individual needs (2) Automated voice recognition (126) <ul style="list-style-type: none"> Negative responses and problems (23) Prior experience with automated voice response Phone limitations
Nurturers (Reinforcing factors for tobacco use or cessation that a person receives from significant others)			
Nurturers: Most common to 18-to-39-year-old age group (n = 44)	Cancer and death of family members (4)		Stress (3) <ul style="list-style-type: none"> Family Parents as smoking role models (3)
Nurturers: Most common to 40+-year-old age-group (n = 52)	Cancer and death of family members (5)		Stress (8) Parents as smoking role models (3)