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Tobacco Cessation Motivations, Preferences, and Barriers Among Rural Smokers: Implications for Optimizing Referrals in Clinical Practice

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Introduction: Rural–urban smoking disparities have widened in recent years because smoking prevalence reductions have been experienced disproportionately among urban adults. Tobacco cessation programs that work in urban settings may not be reaching rural smokers or may need tailoring to be effective. Identifying smoking cessation preferences and barriers among rural smokers can facilitate the implementation of acceptable programs to address rural smoking-related disparities. Thus, the aim of this study was to examine tobacco cessation motivations, preferences, and barriers among rural smokers and to assess smokers' likelihood to use various types of tobacco cessation programs.

Methods: Using a cross-sectional study design, we distributed a self-administered survey to 100 smokers during regularly scheduled healthcare appointments at 3 rural Michigan practices from June to August 2019. We examined differences in participant characteristics by the readiness to quit using chi-square/Fisher's exact tests and described cessation motivations, preferences, and barriers to tobacco cessation among rural smokers.

Results: Participants reporting readiness to quit were less likely to have smoking allowed in their home (31.7% vs. 75.0%; p=0.003) and had a higher prevalence of anxiety (62.1% vs. 6.3%; p=0.0001) and depression (49.2% vs. 18.8%; p=0.04) than those not ready to quit. Preferences were higher for nicotine replacement medications and reward-based approaches, with only 10% of participants being likely to use telephone-based quitlines.

Conclusions: These findings suggest that provider referrals to nicotine replacement medications and reward-based approaches can be used to enhance tobacco cessation among rural smokers.

INTRODUCTION

Cigarette smoking is the leading cause of preventable death in the U.S., implicated in nearly 1 in every 6 deaths or 1,300 deaths every day.[1,2] Consequently, life expectancy for smokers is at least 10 years shorter than for nonsmokers.[1,3] Despite extensive cessation efforts, an estimated 34.1 million U.S. adults smoked cigarettes in 2019.[4]

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2773-0654/$36.00
https://doi.org/10.1016/j.focus.2022.100057

Rural populations experience significant smoking-related disparities, including higher tobacco use,[5,6] and elevated rates of smoking-related cancers and mortality[1] compared with their urban counterparts. Rural–urban smoking disparities have widened in recent years because reductions in smoking have been experienced disproportionately among urban adults.[5] Tobacco cessation programs that work in urban settings may not be reaching rural smokers or may need tailoring to be effective. Indeed, smokers residing in America's rural areas have lower access to tobacco cessation programs[7]; face distinct healthcare access barriers, including transportation challenges across vast geographic regions; and have lower adoption of digital technology, including broadband and smartphones.[8] In clinical settings, the vast majority of smokers are referred only to telephone-based quitlines for cessation, and most never call.[9,10] This is particularly true in rural settings,[11] where social norms and acceptance of tobacco use are often prevalent.[12]

Identifying cessation preferences and barriers among rural smokers can facilitate the implementation of acceptable programs to address the heavy burden of tobacco in rural settings. Thus, the aim of this study was to examine readiness to quit; tobacco cessation motivations, preferences, and barriers; and likelihood to use various tobacco cessation programs among rural smokers.

METHODS

Study Population

The study population included adults (aged ≥18 years) seen at 3 Munson Healthcare (MHC)—affiliated primary care practices in rural Northwest Michigan from June 2019 to August 2019. All the counties served by MHC are considered rural on the basis of the Economic Research Services' rural–urban continuum codes (range=5—9). All patients who reported current smoking during regularly scheduled appointments over the study period were eligible to participate and received the study survey.

Study Design

Using a cross-sectional design, we distributed a self-administered survey to 100 current smokers using a convenience nonprobability sampling approach. Participants were asked to complete the voluntary and anonymous 2-page survey on visit check-in before seeing the provider and return to the clinic front desk. The study survey did not ascertain any identifiable information from participants. Paper surveys were collected by research staff, and responses were entered into a secure, password-protected database by research staff. The study was approved by the MHC IRB.

Measures

The survey assessed tobacco use, previous cessation attempts, and readiness to quit over the next 6 months on the basis of previous questionnaires[13–15] and selected for inclusion through discussions with a community coalition focused on reducing tobacco use in rural Northwest Michigan. Motivations to quit, cessation preferences, and barriers were assessed using a 5-point Likert-type scale ranging from *strongly disagree* to *strongly agree*. We evaluated participants' likelihood to use various tobacco cessation methods, including telephone-based counseling, in-person counseling, text messaging, nicotine replacement medications (e.g., patch, gum, or lozenge), prescription pills (e.g., Chantix, Zyban), and a Quit & Win lottery program, by asking them questions using a Likert-type scale ranging from *not at all* to *very likely*. Participants reported the number of smokers in their household, willingness of friends/household members to join in cessation, and whether smoking was allowed in their household. The survey also included a validated ultrabrief assessment of anxiety and depression (Patient Health Questionnaire-4). Finally, the survey ascertained demographic characteristics; binge alcohol consumption; Internet/e-mail use; and whether they used a cell phone for text messaging, accessing the Internet, sending/receiving emails, downloading applications, and participating in video calls.

Statistical Analysis

First, we described characteristics and tobacco use among rural smokers and examined differences according to readiness to quit using chi-square/Fisher's exact tests. Next, we described motivations to quit, cessation preferences, and barriers across Likert-type scales. Third, we evaluated smokers' likelihood to use various tobacco cessation programs. Missing data were excluded from analyses. All analyses were performed using SAS, Version 9.4 (SAS Institute, Cary, NC), and statistical significance was defined at $p \leq 0.05$.

RESULTS

We excluded 4 individuals who did not use cigarettes, E-cigarettes, or smokeless tobacco in the past 30 days, leaving an analytic study population of 96 individuals. As shown in Table 1, participants ranged in age from 21 to 88 years (an average of 55.6 years). Participants smoked an average of 33.9 pack-years and over 12 cigarettes/day, yet 79.2% were seriously considering quitting in the next 6 months, and 58% had made a quit attempt in the past year. Half of the participants lived with other smokers, and only 13.5% reported that household members or friends would likely join them in a cessation program. Psychosocial distress was reported by 62.5% of smokers, with 48.2% having high anxiety and 38.5% with high depression scores.

Participant characteristics were generally similar between smokers who were ready to quit and those who were not ready to quit. However, smokers ready to quit were more likely to have tried quitting in the past year (63.9% vs. 18.8%; p_{diff}=0.002); were less likely to live in a household where smoking was allowed (31.7% vs. 75.0%; p_{diff}=0.003); and had higher psychosocial distress (18.9% vs. 6.3%; p_{diff}=0.02), anxiety (62.1% vs. 6.3%; p_{diff}=0.0001), and depression (49.2% vs. 18.8%; p_{diff}=0.04).

Participants reported the highest motivations to quit because of overall health benefits and because people important to them want them to quit (Table 2). Nearly 71% of rural smokers agreed that stopping smoking was

Table 1. Characteristics of 96 Rural Smokers, Overall and According to Quit Intentions

Characteristics	Overall (N=96)	Ready to quit (*n*=61)	Not ready to quit (*n*=16)	*p*-Value
Age, years, mean (SD)	55.6 (15.5)	54.0 (15.6)	58.1 (14.6)	0.36
Sex, *n* (%)				0.17
Male	44 (47.3)	26 (43.3)	10 (62.5)	
Female	49 (52.7)	34 (56.7)	6 (37.5)	
Use the Internet or e-mail, at least occasionally, *n* (%)				0.28
Yes	74 (77.9)	48 (78.7)	15 (23.8)	
No	21 (22.1)	13 (21.3)	1 (6.3)	
Cell phone use, *n* (%)				
Have a cell phone	90 (93.8)	60 (98.4)	13 (81.3)	0.03
Send or receive text messages	75 (78.1)	52 (85.3)	11 (68.8)	0.13
Access the Internet on cell phone	57 (59.4)	36 (59.0)	9 (56.3)	0.84
Send or receive e-mail messages on cell phone	53 (55.2)	37 (60.7)	7 (43.8)	0.22
Download and use apps	51 (53.1)	32 (52.5)	8 (50.0)	0.86
Participate in video calls (e.g., FaceTime)	31 (32.3)	20 (32.8)	5 (31.3)	0.91
Type of tobacco product used in the past 30 days, *n* (%)				0.44
Cigarettes only	82 (85.4)	52 (85.3)	13 (81.3)	
E-cigarettes only	6 (6.3)	2 (3.3)	2 (12.5)	
Cigarettes and E-cigarettes	6 (6.3)	5 (8.2)	1 (6.3)	
Cigarettes and smokeless	2 (2.1)	2 (3.3)	0 (0)	
Tobacco use, mean (SD)				
Pack-years	33.9 (16.9)	32.4 (16.7)	37.2 (19.0)	0.32
Number of cigarettes/day	12.2 (7.6)	12.1 (7.5)	15.3 (8.3)	0.15
Minutes until the first cigarette	24.3 (47.2)	21.1 (21.7)	13.8 (16.7)	0.23
Money ($USD) spent per week on cigarettes	35.6 (23.9)	36.5 (24.6)	35.0 (23.6)	0.85
Quitting behavior, *n* (%)				
Tried quitting the past year	49 (52.7)	39 (63.9)	3 (18.8)	0.002
Smoking allowed inside your home, *n* (%)				0.003
Yes	37 (38.5)	19 (31.7)	12 (75.0)	
No	56 (58.3)	41 (68.3)	4 (25.0)	
Number of other smokers in the household, *n* (%)				0.38
None	46 (50.0)	27 (44.3)	9 (56.3)	
1	30 (32.6)	23 (88.5)	3 (18.8)	
≥2	16 (17.4)	11 (18.0)	4 (25.0)	
Would friends/household members who smoke join you in quit program?, *n* (%)				0.54
Yes	13 (15.5)	10 (18.2)	1 (7.7)	
Maybe	32 (38.1)	21 (38.2)	4 (30.8)	
No	39 (46.4)	24 (43.6)	8 (61.5)	
Binge alcohol use in the past 30 days, *n* (%)				0.34
Yes	26 (32.9)	21 (40.4)	3 (23.1)	
No	53 (67.1)	31 (59.6)	10 (76.9)	
Psychological distress (PHQ-4), *n* (%)				0.02
None (0−2)	33 (37.5)	15 (38.3)	9 (56.3)	
Mild (3−5)	26 (29.6)	13 (24.5)	6 (37.5)	
Moderate (6−8)	15 (17.1)	15 (28.3)	0 (0.0)	
Severe (9−12)	14 (15.9)	10 (18.9)	1 (6.3)	
Anxiety subscale, *n* (%)				0.0001
Negative (<3)	47 (51.7)	22 (37.9)	15 (93.8)	

(*continued on next page*)

Table 1. Characteristics of 96 Rural Smokers, Overall and According to Quit Intentions (*continued*)

Characteristics	Overall (N=96)	Ready to quit (*n*=61)	Not ready to quit (*n*=16)	*p*-Value
Positive (≥3)	44 (48.4)	36 (62.1)	1 (6.3)	
Depression subscale, *n* (%)				0.04
Negative (<3)	56 (61.5)	30 (50.9)	13 (81.3)	
Positive (≥3)	35 (38.5)	29 (49.2)	3 (18.8)	

Note: Readiness to quit was determined on the basis of response to the following question: *Are you seriously considering quitting smoking in the next six months?* (*n*=19 participants were missing information). The *p*-values reflect differences according to quitting intentions on the basis of *t* test (continuous variables) or chi-square/Fisher's exact test
PHQ-4, Patient Health Questionnaire-4; USD, U.S. dollar.

something that they had to do on their own. Participants reported that smoking helps them to cope with stress, whereas scheduling time with cessation coaches, high smoking prevalence in the community, and lack of access to cessation coaches were also reported.

Only 10% of participants reported being likely to try telephone-based quitlines, the current standard of care for patient referral (Figure 1). Nearly half of the participants were likely to use nicotine replacement medication, and 35.7% of the participants were likely to use prescription medications. A Quit and Win program where smokers quit smoking for the chance to win a lottery prize was also favorably viewed, with 30% of participants being likely to use it.

DISCUSSION

In this study, long-term tobacco use was common, and the intention to quit was high. Participants were motivated to quit smoking to improve overall health and because people important to them wanted them to quit. Commonly reported cessation barriers included coping with stress, scheduling counseling, and finding coaches.

Table 2. Smoking Cessation Motivations, Preferences, and Barriers Among Rural Smokers

How much do you agree or disagree with the following statements?	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Motivations to quit					
I would like to quit smoking so I could save the money I spend on cigarettes.	6 (6.3)	5 (5.2)	20 (20.8)	39 (40.6)	26 (27.1)
People important to me want me to try to quit.	4 (4.3)	1 (1.1)	11 (11.8)	36 (38.7)	41 (44.1)
I would like to quit smoking because it is good for my overall health to stop.	3 (3.2)	3 (3.2)	7 (7.5)	28 (29.8)	53 (56.4)
If I keep trying, I will eventually be able to permanently quit smoking.	3 (3.1)	2 (2.1)	27 (28.1)	34 (35.4)	27 (28.1)
Smoking keeps me from doing things I want to do (like sports or being with friends).	16 (17.0)	27 (28.7)	22 (23.4)	22 (23.4)	7 (7.5)
I need to quit smoking so I can get medical care that has been recommended (e.g., a surgery).	21 (22.3)	25 (26.6)	30 (31.9)	8 (8.5)	10 (10.6)
Cessation preferences					
Stopping smoking is something that I have to do on my own.	4 (4.2)	5 (5.2)	19 (19.8)	36 (37.5)	32 (33.3)
Talking regularly with a quit smoking coach would at least double my chance of quitting.	11 (11.5)	13 (13.5)	38 (39.6)	28 (29.2)	6 (6.3)
I plan to work with a quit smoking coach the next time I try to quit.	15 (16.1)	16 (17.2)	41 (44.1)	15 (16.1)	6 (6.5)
Cessation barriers					
It is easy for me to find a quit smoking coach in my community.	12 (12.8)	18 (19.2)	44 (46.8)	16 (17.0)	4 (4.3)
My work schedule would make it difficult to talk regularly with a quit smoking coach.	22 (23.4)	24 (25.5)	21 (22.3)	20 (21.3)	7 (7.5)
It would be difficult to get transportation to regular meetings with a quit smoking coach.	24 (25.3)	33 (34.7)	23 (24.2)	9 (9.5)	6 (6.3)
Smoking helps me cope with stress.	3 (3.2)	2 (2.1)	10 (10.6)	38 (40.4)	41 (43.6)
Everywhere I go in my community, I see people or things that make me want to smoke.	7 (7.5)	30 (39.4)	32 (34.0)	14 (14.9)	11 (11.7)

Note: All values are given in n (%).

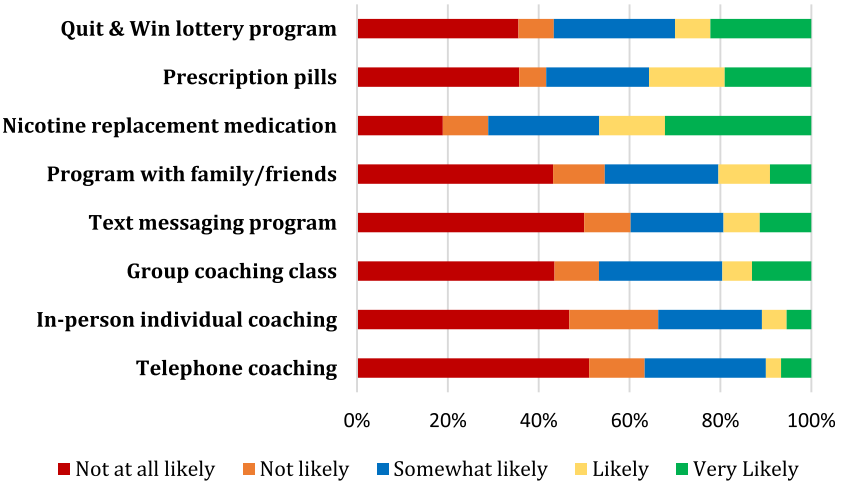

Figure 1. Likelihood to use various types of smoking cessation programs among rural smokers.

Preferences for cessation program type varied, with nicotine replacement medications and reward-based lottery approaches being the most favorable.

Smokers reported strong social norms around smoking acceptability and the pervasiveness of smoking in the rural community. Indeed, social norms appeared to influence smoking habits in this study. For example, individuals living in homes where smoking was allowed were less likely to report intentions to quit. These findings suggest that a socioecologic approach, including policies to shift smoking norms and prevent tobacco use initiation among youth, can optimize tobacco cessation efforts in rural settings.

Similar to findings from previous research,[16] our results suggest that rural smokers have distinct and variable tobacco cessation preferences. Overall, rural smokers in this study reported higher preferences for nicotine replacement medications and reward-based approaches and were less likely to prefer telephone-based cessation coaching. This finding is important given that the current standard of care for smoking cessation in many rural healthcare systems centers on *Ask Advise Refer*,[17] in which the vast majority of smokers are referred only to telephone quitlines. These findings suggest that offering nicotine replacement medication and tailored approaches accounting for rural smokers' preferences and barriers may better empower smokers to quit.[18]

Limitations

Strengths of this study include the involvement of a community coalition in the study design, survey development, and interpretation of findings, which enhances the relevance and impact of the study findings. However, the study population was small, representing a convenience sample of smokers accessing clinical care through a rural healthcare system, and may not be representative of all rural smokers. Additional limitations include the reliance on self-reported measures, the assessment of only identified barriers to cessation, and the cross-sectional design, which precluded our ability to assess temporal associations.

CONCLUSIONS

Provider referrals to nicotine replacement medications and reward-based approaches may enhance tobacco cessation among rural smokers.

ACKNOWLEDGMENTS

The authors thank the volunteers who participated in this research and the clinical offices in the Munson Healthcare network serving as study sites for recruitment.

This study was approved by the IRB at Munson Healthcare (Number 1455288).

DECLARATIONS OF INTEREST

None.

CREDIT AUTHOR STATEMENT

Kelly A. Hirko: Conceptualization, Methodology, Writing – original draft. **Patti Moore:** Data curation, Writing – review & editing. **Lawrence C. An:** Conceptualization, Writing – review & editing. **Sarah T. Hawley:** Conceptualization, Methodology, Writing – review & editing.

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