

Exploring the role of telehealth: A novel approach to group-based smoking cessation treatment for men incarcerated in a rural state prison

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Abstract

Introduction: Tobacco smoking remains an important public health issue in the United States (US), specifically among people who are incarcerated. There is little to no information about smoking behaviors of incarcerated people in rural areas and there is a lack of resources for smoking cessation interventions in rural settings. Telehealth might be efficient for delivering care to incarcerated people in rural areas. The purpose of this study was to determine the feasibility of delivering group-based smoking cessation treatment via telehealth to incarcerated male smokers in a rural prison.

Methods: A 6-week group-based smoking cessation treatment program was conducted with 1-month follow up. Video conferencing was used from Weeks 2–5 to deliver treatment. A cross-sectional survey was administered collecting measures including criminal justice experience, smoking behaviors, withdrawal and triggers, mental health, physical health, and substance use. Baseline exhaled carbon monoxide (CO) levels were collected at Session 1, and a final CO level at Session 6 and 1-month follow-up.

Results: Twenty ($n=20$) incarcerated male smokers were recruited from a rural prison facility. The majority of the inmates were White (85%). Approximately, 80% of the inmates smoked about 20 or more cigarettes per day, and on average smoked for 28 years ($SD=9$). Most inmates scored a moderate or high dependence score on the Fagerström Test for Nicotine Dependence.

Conclusion: Telehealth programs such as video conferencing smoking cessation treatment ought to be implemented to reduce tobacco-related disparities among incarcerated smokers housed in rural prisons.

Keywords

Group-based smoking cessation treatment, telehealth, rural prison, incarceration, men

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Introduction

People with a history of incarceration have a higher burden of chronic medical conditions (e.g. high blood pressure, stroke-related issues, heart-related problems, diabetes, and asthma), and mental health challenges than the general adult population.^{1,2} Approximately 56% of incarcerated persons in state prisons and 45% in federal prisons reports having a mental disorder.^{1,3} Additionally, 74% of state prisoners with a mental health challenge also meet the criteria for substance dependence or abuse.³ Moreover, smoking is extremely prevalent in United States (US) state prisons, with 65% self-reporting

smoking behaviors.⁴ Many chronic conditions that inmates have, such as heart disease and stroke-related problems, can be attributable to tobacco smoking.⁵

In the US, smoking is attributed to 20% of all cancer diagnoses, and specifically 80% of all lung cancer cases

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and lung cancer deaths.⁵ Tobacco use remains a prominent public health issue among people who are incarcerated in the US. As tobacco remains the leading preventable cause of death,⁶ and as cancer is the second leading cause of death in the US,⁷ it is critical to address tobacco dependence among incarcerated people, especially those housed in rural areas. People who live in rural areas have 18%–20% higher lung cancer rates than those living in urban areas.⁸ The most effective way to prevent smoking-related cancers is to prevent smoking or quit smoking, and by quitting smoking, people can lower their risk of 12 types of cancer, including lung cancer.^{9,10} Compared to the general population, tobacco smoking is about three to four times higher among the incarcerated population.^{11–13}

Currently, there is a lack of data available concerning smoking behaviors among people incarcerated in rural areas. While smoking cessation programs have been successful in the general population, little to no interventions are available to the incarcerated population in rural areas.^{13–16} However, smoking cessation programs tailored to the incarcerated population would benefit this population.^{16,17} Telehealth is the use of technology (e.g. social media, tablet wearables, apps, text messaging for behavioral interventions, and remote monitoring) that could potentially be used to mitigate the structural challenges of distance and location to address tobacco smoking.^{18–20} For example, Rutgers Robert Wood Johnson Medical School administers Project ECHO, Extension for Community Healthcare Outcomes, a collaborative online medical education program that enables primary care providers to attain specialist knowledge in various areas (e.g. substance use disorders). Thus, creating expanded access and reducing costs of specialty care for underserved patients in New Jersey.²¹ Telehealth services include but are not limited to prevention, clinical, and continuum of care services such as online consultations, virtual monitoring, and patient triaging.¹⁹

Telehealth has shown some promising applications for smoking cessation.^{18,22} Evaluations from a web-based smoking cessation program in rural Canada indicated that most participants felt comfortable using electronic communication technology (67%) and receiving group-based cessation services in a virtual setting (86%), resulting in a quit rate of 71% in 12 months.¹⁸ Additionally, a paucity of telehealth-based smoking cessation interventions exist.

The present study

To address this knowledge gap, we examine the feasibility of delivering group-based smoking cessation counseling with pharmacotherapy, nicotine replacement therapy patches via telehealth to incarcerated male smokers. The study aimed to provide evidence-based smoking cessation treatment for incarcerated smokers in rural settings where resources are limited.

Methods

Participants

The sample comprised of 20 men who were incarcerated in a rural prison facility and enrolled in a group-based, video conferencing smoking cessation treatment program with nicotine replacement therapy, patches from May 2019 to August 2019. Due to the location and distance of this prison site, telehealth in the form of video conferencing approaches was implemented for Weeks 2 to 5. The first author and a trained tobacco researcher collected exhaled breath carbon monoxide (CO) levels at Week 1 and Week 6. The average age at enrollment was 43 (SD = 7.76), and most participants were White (85%), followed by Latino (10%). Overall, a majority of the inmates were either overweight (55%) or obese (15%).

Procedures

The data for the present analysis was collected as part of examining the preliminary efficacy of a group-based smoking cessation treatment program in seven prison facilities.¹⁶ Between May 2019 and August 2019, study personnel recruited and screened 350 participants in seven prison facilities for eligibility for a 6-week, evidence-based group smoking cessation treatment program, with 1-month follow-up to help cisgender men and transgender female smokers quit smoking.¹⁶ Study participants met the following eligibility criteria: (a) ≥ 18 years of age; (b) able to speak, read, and write in English well enough to understand the informed consent procedures and complete the study; (c) smoked at least 5 cigarettes per day over the past 7 days, as confirmed by the carbon monoxide (CO) level;²³ (d) residing in the prison's general adult population; (not in solitary confinement); (e) able to provide informed consent; and (f) medically eligible to use pharmacotherapy, in the form of nicotine replacement therapy patches, as determined by the prison medical staff. The goal of the larger study was to implement a group-based smoking cessation treatment program for incarcerated smokers. The Rutgers Institutional Review Board approved the study procedures.

Research participants were recruited at seven prison facilities using various data collection approaches. First, advertisement about the study and sign-in sheets were posted at each of the prison facility's cafeteria, housing units, and TV channels. Inmates interested in participating in the study were asked to complete baseline assessments with the prison medical staff, a brief cross-sectional smoking behavior survey, and informed consent procedures. Approximately 173 individuals did not meet eligibility criteria due to incomplete baseline assessments, not completing informed consent forms, or unknown smoking status. While the study enrolled 177 participants, only

102 men completed the program. A description of the group-based smoking cessation treatment program's efficacy is discussed elsewhere.¹⁶

Measures

Sociodemographic characteristics. Race and ethnicity, age, sexual orientation, state residence prior to incarceration, marital status, primary language, the highest level of education, and body mass index were investigated.

Criminal justice experience. We asked participants the age of their first incarceration, the charges of their first-time incarceration, current prison employment status, and conditions (a broad question that examined overcrowding, abuse, and overall safety) of the prison facility.

Smoking behaviors. Smoking behaviors were assessed by asking the men the following items: age when the participant first became a daily smoker, number of years smoked cigarettes in their lifetime, the number of cigarettes smoked per day, whether participate butt out or relight their cigarette, whether they smoke menthol cigarettes, determination of nicotine dependence by using the Fagerstrom Test for Nicotine Dependence,²⁴ quit attempts, use of electronic cigarettes, other tobacco products, money spent on cigarettes per week, methods of obtaining money for cigarettes, and smoking behaviors since incarceration (e.g. started to smoke, smoke more, quit smoking, or no change), and whether medical professionals talked to them about quitting smoking.

Withdrawal and triggers. Participants were asked about symptoms of withdrawal and triggers after quitting smoking. They were able to select each of the options as "yes" or "no."

Mental health, physical health, and substance use. Participants were asked about current mental disorders, physical health, and substance use history. They were able to select each of the option as "yes" or "no."

Attendance and exhaled CO. Attendance and exhaled carbon monoxide were collected at Session 1, Session 6, and at one-month after completing the program.

Implementing group-based smoking-cessation telehealth in a prison facility

Incarcerated cisgender men and transgender female smokers in prison sites A-F received the intervention in person by trained tobacco treatment specialists. Handouts for each session were mailed to the prison facility before the start of the program. At the initial visit with Prison

Site G, the trained tobacco treatment specialist discussed informed consent procedures, initial assessments, and the cessation program through video conferencing. After the initial visit, subsequent follow up visits were made using telehealth. Once the team reviewed their clinical assessment and smoking behavior data, study participants in Prison Site G were seen by trained tobacco treatment specialists via video enabled HIPPA compliant/encrypted interface (i.e. WebEx) for weeks 2–5. An encrypted secure WebEx link for the video conferencing was shared directly with the prison liaison. Prison administrators permitted the use of the Chapel for group-based smoking cessation treatment. The television monitor inside of the Chapel was connected to the Internet, allowing study participants to communicate with the facilitators through video conferencing at their host institution. A standalone microphone was provided to help participants increase the sound and volume in the room. To limit background noise, participants were occasionally reminded not to talk over each other and speak one at a time.

At each weekly session, a callout with the study participants' names was shared with the correctional officers managing the housing units where the study participants resided. The men were sent to the Chapel for their weekly smoking cessation treatment session in the afternoon for 90 minutes group treatment. At the beginning of each session, discussions around coping strategies, managing withdrawals, stress, boredom, and potential general suggestions were provided. In some cases, study participants followed up by contacting the prison liaison, and recommendations for additional support services with prison medical staff were made available. At week 6, the tobacco treatment facilitators met with the study participants in-person to complete CO monitoring and they asked participants how comfortable they were using telehealth. Feedback included comments such as, "We appreciated speaking with experts in tobacco cessation." "We are grateful for everyone's time." "I was able to speak freely and honestly, quitting smoking in prison is very hard."

Results

Among the 20 inmates who were enrolled in the group-based, video conferencing smoking cessation program, the average age at enrollment was almost 43 (SD = 7.76), and a majority of them were White (85%), followed by Latino (10%). Overall, most inmates were either overweight (55%) or obese (15%). Table 1 describes the smoking characteristics of the participants.

Criminal justice experience

Table 2 describes the criminal justice experience of the sample. On average, inmates were first incarcerated

around the age of 24 (SD = 9.36) and were incarcerated for a property offense (40%), drug distribution offense (15%), or drug possession offense (15%). In addition, the majority of the men were incarcerated for about five years. Most of them were employed in the facility (85%).

Smoking behaviors

In Table 3, the smoking behaviors of the participants are presented. Almost all inmates enrolled were smoking 20 or more cigarettes per day (80%) and had been smoking around 28 years (SD = 9.78). On the Fagerström Test for Nicotine Dependence, none of the inmates enrolled scored low or low-moderate dependence but rather moderate (45%) and high dependence (45%). The most common tobacco product individuals reported were chew/snuff (60%) and cigars (45%). Additionally, 11 inmates reported currently using an electronic cigarette. Most men reported spending less than \$25 per week on cigarettes and other tobacco products.

Withdrawal and triggers

The three highest reported withdrawal symptoms that inmates experienced, in terms of cigarette smoking, were cravings (75%), frustration (75%), and impatience/restlessness (75%). Moreover, the three highest reported triggers for tobacco use were if they were around other smokers/chewers (95%), after meals (90%), and before going to bed (85%). Withdrawal symptoms and triggers are summarized in Table 4.

Mental health, physical health, and substance use

A small number of inmates reported that they currently have heart disease/high blood pressure/high cholesterol ($n = 5$) and even fewer reported having kidney or liver disease ($n = 4$). Additionally, 20% of the men self-reported currently having depression. The highest substance use history reported were marijuana (40%), abusing alcohol (35%), cocaine (30%), and heroin (30%). Table 5 describes the medical conditions, substance use, and mental disorders experienced by the study participants.

Attendance and exhaled carbon monoxide

Attendance and exhaled CO were collected at Session 1, Session 6, and at 1-month follow-up. At Session 1, 15 individuals were recorded as attended and the median CO level was 3.00 parts per million (ppm) with a range between 1.00 to 5.00 ppm. At Session 6, there were 12 inmates that attended the session with a median CO level at 4.00 ppm and the range 3.00 to 7.00 ppm. There were no statistical differences between Session 1 and Session 6. Finally,

there were no inmates who attended the 1-month follow-up in person.

Discussion

This study takes a novel approach to expanding telehealth in the form of video conferencing to extremely vulnerable and hardly reached populations. People who are incarcerated and housed in rural communities are disadvantaged in several respects.^{25,26} Rural prisons have relatively few resources, including a limited supply of nurses and doctors who must care for a population with a higher prevalence of health needs.²⁷ If an inmate needs care beyond what is available in the prison, they are then faced with the difficulty of receiving care in a rural setting.^{28,29} Rural locations have fewer and less specialized health care resources, which may result in a lower quality of care overall.³⁰ Given the negative health impacts of tobacco smoking, reducing the number of smokers in rural prisons may reduce the risk of tobacco-related health disparities.^{10,31}

Both inmates and those residing in rural areas experience greater obstacles accessing medical care and treatment.^{25,26,32-34} Telehealth expands access to care for inmates and residents of rural communities where providers or specialists are often inaccessible. Similarly, video conferencing may make it possible for incarcerated persons to have access to tobacco treatment specialists to aid in smoking abstinence. With the expansion of reimbursement to provide telehealth services to Medicare and Medicaid recipients, healthcare providers can ensure adequate services are extended to those who lack access to facilities. Our experience remote group-based smoking cessation treatment allows us to suggest that virtual platforms may be one solution to addressing inequities in access to tobacco cessation among people who are incarcerated.

With 80% of the sample smoking 20 or more cigarettes, smoking is prevalent among this cohort of inmates. As mentioned earlier in this article, smoking is related to health conditions such as lung disease, particularly cancer. Although this cohort self-reported a lack of physical health issues, this does not mean they cannot develop underlying health conditions in the future, especially as the average amount of time for smoking was 28 years. The longer an individual smokes cigarettes, the more they increase their chance of developing smoking-related health conditions and cancer.³⁵ Since tobacco use can cause cancer; smoking cessation programs should be prioritized in rural prisons to provide adequate care and resources to inmates to help prevent cancer-related disparities.

The current evidence concerning telehealth interventions in correctional settings has focused on providing telemedicine to address mental disorders.^{36,37} Senanayake et al. completed a scoping review on using telemedicine in

Table 1. Sociodemographic characteristics of male incarcerated smokers.

Variable	Total sample (n = 20)	Completed program (n = 12)	Not complete program (n = 8)	p-value
Current age	42.80 (7.76)	41.33 (8.39)	45.00 (6.59)	0.313
Sexual orientation				0.760
Gay/homosexual/bisexual	2 (10.0)	1 (8.3)	1 (12.5)	
Heterosexual/straight	18 (90.0)	11 (91.7)	7 (87.5)	
State residence prior to incarceration				0.197
Northeast	17 (85.0)	11 (91.7)	6 (75.0)	
South	1 (5.0)	0 (0)	1 (12.5)	
Missing	2 (10.0)	1 (8.3)	1 (12.5)	
Current marital status				0.567
Single, never married	11 (55.0)	6 (50.0)	5 (62.5)	
Married	4 (20.0)	2 (16.7)	2 (25.0)	
Divorced/separated/widowed	5 (25.0)	4 (33.3)	1 (12.5)	
Race/Ethnicity				0.241
Caucasian/White	17 (85.0)	10 (83.3)	7 (87.5)	
African American/Black	1 (5.0)	0 (0)	1 (12.5)	
Hispanic/Latinx	2 (10.0)	2 (16.7)	0 (0)	
Primary language spoken at home				0.402
English	19 (95.0)	11 (91.7)	8 (100.0)	
Both English and Spanish	1 (5.0)	1 (8.3)	0 (0)	
Highest level of education achieved				0.361
High school/GED or less	10 (50.0)	5 (41.7)	5 (62.5)	
Some college/technical school	10 (50.0)	7 (58.3)	3 (37.5)	
Body Mass Index (BMI)				0.156
Normal	2 (10.0)	0 (0)	2 (25.0)	
Overweight	11 (55.0)	7 (58.3)	4 (50.0)	
Obese	3 (15.0)	3 (25.0)	0 (0)	
Missing	4 (20.0)	2 (16.7)	2 (25.0)	

BMI: body mass index; GEDD: general educational development.

correctional settings and identified; the majority ($n = 23$, 64%) were conducted in the US. The most common issue addressed by telemedicine was mental health ($n = 13$, 36%), followed by ophthalmology ($n = 4$, 11%).³⁶ While telehealth has been used to provide mental health services in correctional settings, this present study is important because it is the first to describe how telehealth could increase the opportunity for incarcerated people to access tobacco treatment specialists. Therefore, as telehealth becomes prominent in health care settings, improving access to telehealth for incarcerated people is vital to reduce barriers to care, treatment, and existing tobacco-related health disparities.

To the best of our knowledge, this is the first study of its kind that explores the use of telehealth-based intervention for smoking cessation group treatment with pharmacotherapy for men who are incarcerated in a rural prison. We collaborated successfully with prison personnel and the Department of Corrections to deliver virtual group-based smoking cessation counseling. While prison facilities have restrictions on technology services, prison chapels that are equipped with Wi-Fi and video conferencing may be well suited for telehealth services for individuals

and/or small groups. As seen in this pilot study, the remote platform seamlessly delivered cessation counseling from Weeks 2 to 5 at the prison facility. In addition, this study demonstrates that it is feasible to offer group-based smoking cessation treatment to remote prison facilities using video conferencing. Telehealth-based care delivery, treatment, and prevention allow the incarcerated population to receive a standard of care.

It is important to note that the study requires minimal investment in time and resources from the perspective of the prison if video conferencing technology is already in place. However, future research is needed to determine the effectiveness of group-based, video conferencing smoking cessation treatment versus a traditional face-to-face setting. This impact may be particularly acute in rural prisons, as they have smaller local populations from which to find a trained expert to implement an in-person smoking cessation program.

Limitations

Despite these strengths, the study is not without limitations. First, the small sample size and no comparison group

Table 2. Criminal justice experience.

Variable	Total sample (n = 20)	Completed program (n = 12)	Not completed program (n = 8)	p-value
Age of first incarceration	24.05 (9.36)	26.08 (10.08)	20.57 (7.37)	0.225
Months in prison for current incarceration	62.75 (68.06)	50.33 (36.97)	81.38 (98.82)	
Charges for first-time incarceration ^a				
Drug distribution offense	3 (15.0)	3 (25.0)	0 (0)	
Drug possession offense	3 (15.0)	3 (25.0)	0 (0)	
Property offense (e.g. theft, burglary, car theft, etc.)	8 (40.0)	3 (25.0)	5 (62.5)	
Rape, sexual assault	2 (10.0)	2 (16.7)	0 (0)	
Molestation	2 (10.0)	1 (8.3)	1 (12.5)	
Current employment in prison				0.684
Working	17 (85.0)	10 (83.3)	7 (87.5)	
Student	2 (10.0)	1 (8.3)	1 (12.5)	
Unemployed, but looking	1 (5.0)	1 (8.3)	0 (0)	
Condition of facility during current incarceration				0.471
Poor	5 (25.0)	4 (33.3)	1 (12.5)	
OK	11 (55.0)	6 (50.0)	5 (62.5)	
Good	3 (15.0)	2 (16.7)	1 (12.5)	
Very good	1 (5.0)	0 (0)	1 (12.5)	

^aParticipants were able to select each of the options as “yes” or “no.” Frequencies were calculated out of total sample size (n = 178) for each offense committed.

(in-person group in this rural prison facility) limits the generalizability of the findings. Ongoing research is necessary to assess the benefits of telehealth tobacco cessation treatment for incarcerated persons. Second, the impact of missing data in this study weakens the generalizability of the findings, decreases statistical power, increases standard errors, and, most importantly, includes the loss of valuable information.³⁸ In this pilot and feasibility study, only 12 participants completed the program, and study participants did not attend the 1-month follow-up. It is not yet clear whether video conferencing would be appropriate in this setting. Furthermore, better outreach is needed to encourage the men to attend the follow up visit either in person or remotely.

Better procedures to maintain participant’s privacy and comfort are needed when administering telehealth virtual smoking cessation treatment for incarcerated persons. Although participants indicated that they felt comfortable sharing their challenges with tobacco smoking, privacy might be compromised in this setting. Some participants may have been unable to share willingly for fear of retaliation from prison staff and guards.

Further research is merited, and replication should be attempted in other rural prisons. We found that the small group atmosphere may be optimal for telehealth smoking cessation treatment. Future studies should attempt to recruit a more racially diverse group of participants. Successful results achieved under these parameters would improve the strength of the findings and increase their generalizability to the broader prison population

incarcerated in rural locations. Generalizability would also be enhanced by including a female cohort in future studies.

Implications for smoking cessation treatment programming

More research is needed to expand our knowledge about smoking behaviors in prisons in rural areas. Additional studies are needed to compare in-person, group-based smoking cessation treatment versus group-based, video conferencing smoking cessation treatment. In some cases, online groups may be the only option for many incarcerated persons in rural areas. Furthermore, people living in rural areas are reported to have 18%–20% higher rates of lung cancer than people living in urban areas.⁸ This is of concern because rural areas are less likely to have access to smoking cessation programs.^{36,39} It is necessary to implement more evidence-based programs in rural areas to help provide resources to quitting smoking and to prevent long-term health issues.

Telehealth may be used to minimize the need for physical proximity in service delivery and has been effective in delivering several interventions^{36,37} including web- and computer-based smoking cessation programs.^{36,37,39–43} Telehealth has also reported benefits with rural populations in Australia, with patients highlighting improved service access, improved service quality, and reduced inconvenience in accessing services.⁴²

Table 3. Smoking behaviors of male incarcerated smokers ($n = 20$).

Variable	N(%) or Mean (SD)
Age first became a daily smoker	16.00 (4.60)
Number of years smoked cigarettes	28.40 (9.78)
Cigarettes smoked per day	
Fewer than 10	2 (10.0)
10–19 cigarettes	2 (10.0)
20 or more cigarettes	16 (80.0)
Butt out or relight cigarette	
Yes	17 (85.0)
No	3 (15.0)
Smoke menthol cigarettes	
Yes	16 (80.0)
No	4 (20.0)
Fagerstrom test for nicotine dependence	
Moderate dependence	9 (45.0)
High dependence	9 (45.0)
Missing	2 (10.0)
Attempted quitting tobacco smoking for more than 24 h	
Yes	16 (80.0)
No	4 (20.0)
Number of quit attempts for more than 24 h	
None	4 (20.0)
One to four times	10 (50.0)
Five to ten times	2 (10.0)
More than 10 times	4 (20.0)
Electronic cigarette ever use	
Yes	11 (55.0)
No	9 (45.0)
Pipe ever use	
Yes	2 (10.0)
No	18 (90.0)
Cigar ever use	
Yes	9 (45.0)
No	11 (55.0)
Chew/snuff ever use	
Yes	12 (60.0)
No	8 (40.0)
Money spent on cigarettes per week	
None	1 (5.0)
Less than \$25	15 (75.0)
\$26 to \$50	4 (20.0)
Methods of obtaining money for cigarettes ^a	
Friends and family	12 (60.0)
Working a job	17 (85.0)
Barter/trade	7 (35.0)
Free from friends	7 (35.0)
Other	4 (20.0)
Smoking behavior since incarceration	
Started to smoke	2 (10.0)
Smoke more	8 (40.0)
Smoke less	2 (10.0)
Quit smoking	4 (20.0)
No change	4 (20.0)

(continued)

Table 3. Continued

Variable	N(%) or Mean (SD)
Medical professional talk about quitting smoking	
Yes	8 (40.0)
No	12 (60.0)

^aParticipants were able to select each of the options as “yes” or “no.” Frequencies were calculated out of total sample size ($n = 20$) for each method of obtaining money to purchase cigarettes.

Conclusion

Tobacco smoking remains a public health issue in the US, especially in the incarcerated population. In a time of budget uncertainty resulting from the COVID-19 pandemic, using novel approaches such as telehealth or virtual tobacco cessation treatment programs could be cost-

Table 4. Withdrawals and triggers of nicotine^a.

Variable	N(%)
Withdrawal symptoms	
Agitation/irritability	14 (70.0)
Anger/hostility	8 (40.0)
Anxiety/nervousness	14 (70.0)
Craving	15 (75.0)
Difficulty concentrating	5 (25.0)
Fatigue	3 (15.0)
Disorientation	4 (20.0)
Frustration	15 (75.0)
Increased appetite/weight gain	8 (40.0)
Depressed mood	11 (55.0)
Impatience/restlessness	15 (75.0)
Insomnia	6 (30.0)
Triggers for tobacco use	
Attending meetings	5 (25.0)
Anxiousness	14 (70.0)
Under stress	15 (75.0)
Needing to concentrate	5 (25.0)
Drinking coffee, tea, or soda	16 (80.0)
Talking on the phone	3 (15.0)
To keep busy	4 (20.0)
Around other smokers (chewers)	19 (95.0)
Before going to bed	17 (85.0)
Alone and bored	16 (80.0)
Children present	2 (10.0)
After meals	18 (90.0)
Relaxing	11 (55.0)
Wanting to cheer up	4 (20.0)
Hunger	8 (40.0)
Pain	10 (50.0)

^aParticipants were able to select each of the options as “yes” or “no.” Frequencies were calculated out of total sample size ($n = 20$) for each of the uncomfortable symptoms and triggers.

Table 5. Current mental and physical health and ever use of substances (n = 20).

Variable	N (%)
Physical health	
Heart disease/high blood pressure/high cholesterol	
Yes	5 (25.0)
No	15 (75.0)
Diabetes	
Yes	1 (5.0)
No	19 (95.0)
Lung disease (asthma or COPD)	
Yes	1 (5.0)
No	19 (95.0)
Kidney or liver disease	
Yes	4 (20.0)
No	16 (80.0)
Dental problems	
Yes	1 (5.0)
No	19 (95.0)
Sinus or nasal problems (rhinitis, polyps)	
Yes	3 (15.0)
No	17 (85.0)
Mental health	
Depression	
Yes	4 (20.0)
No	16 (80.0)
Anxiety	
Yes	1 (5.0)
No	19 (95.0)
Substance use^a	
Abused alcohol	7 (35.0)
Marijuana use	8 (40.0)
Cocaine use	6 (30.0)
Heroin use	6 (30.0)
Caffeine in excess	4 (20.0)

^aParticipants were able to select each of the options as “current” or “past.” Frequencies were calculated out of total sample size (n = 20) for each of the substances for either selecting current or past use.
COPD: chronic obstructive pulmonary disease.

effective, timely, and improve smoking cessation outcomes for inmates in rural prisons.

Declaration of conflicting interests

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References

1. Al-Rousan T, Rubenstein L, Sieleni B, et al. Inside the nation’s largest mental health institution: a prevalence study in a state prison system. *BMC Public Health* 2017; 17: 342.
2. Maruschak LM, Berzofsky M and Unangst J. Medical problems of state and federal prisoners and jail inmates, 2011-12. Report, US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, Washington, DC, February 2015.
3. James D and Glaze L. Mental health problems of prison. Report, US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, Washington, DC, September 2006.
4. Kennedy SM, Sharapova SR, Beasley DD, et al. Cigarette smoking among inmates by race/ethnicity: impact of excluding African American young adult men from national prevalence estimates. *Nicotine Tob Res* 2016; 18: S73–S78.
5. American Cancer Society. Health risks of smoking tobacco. *American Cancer Society*, <https://www.cancer.org/healthy/stay-away-from-tobacco/health-risks-of-tobacco/health-risks-of-smoking-tobacco.html> (2020, accessed 7 April 2021).
6. U.S. Department of Health and Human Services. The health consequences of smoking—50 years of progress: A report of the surgeon general. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Atlanta, GA, 2014.
7. Centers for Disease Control and Prevention. An update on cancer deaths in the United States. *Centers for Disease Control and Prevention*, <https://www.cdc.gov/cancer/dcpcl/research/update-on-cancer-deaths/index.htm> (2021, accessed 8 April 2021).
8. Singh GK, Williams SD, Siahpush M, et al. Socioeconomic, rural-urban, and racial inequalities in US cancer mortality: part I—All cancers and lung cancer and part II—colorectal, prostate, breast, and cervical cancers. *J Cancer Epidemiol* 2011; 2011: 1–27.
9. Centers for Disease Control and Prevention. Smoking and cancer. *Centers for Disease Control and Prevention*, <https://www.cdc.gov/tobacco/campaign/tips/diseases/cancer.html> (2021, accessed 8 April 2021).
10. U.S. Department of Health and Human Services. Smoking cessation: A report of the surgeon general. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Atlanta, GA, 2020.
11. Cropsey KL and Kristeller JL. Motivational factors related to quitting smoking among prisoners during a smoking ban. *Addict Behav* 2003; 28: 1081–1093.
12. Cropsey KL and Kristeller JL. The effects of a prison smoking ban on smoking behavior and withdrawal symptoms. *Addict Behav* 2005; 30: 589–594.
13. Cropsey K, Eldridge G, Weaver M, et al. Smoking cessation intervention for female prisoners: addressing an urgent public health need. *Am J Public Health* 2008; 98: 1894–1901.
14. Kauffman RM, Ferketich AK and Wewers ME. Tobacco policy in American prisons, 2007. *Tob Control* 2008; 17: 357–360.

15. Spaulding AC, Eldridge GD, Chico CE, et al. Smoking in correctional settings worldwide: prevalence, bans, and interventions. *Epidemiol Rev* 2018; 40: 82–95.
16. Valera P, Acuna N and Vento I. The Preliminary efficacy and feasibility of group-based smoking cessation treatment program for incarcerated smokers. *American Journal of Men's Health* 2020; 7. doi:10.1177/1557988320943357.
17. Cropsey KL, Jones-Whaley S, Jackson DO, et al. Smoking characteristics of community corrections clients. *Nicotine Tob Res* 2010; 12: 53–58.
18. Carlson LE, Lounsberry JJ, Maciejewski O, et al. Telehealth-delivered group smoking cessation for rural and urban participants: feasibility and cessation rates. *Addict Behav* 2012; 37: 108–114.
19. Dosaj A, Thiagarajan D, ter Haar C, et al. Rapid implementation of telehealth services during the COVID-19 pandemic. *Telemed E-Health* 2021; 27: 116–120.
20. Ford D, Harvey JB, McElligott J, et al. Leveraging health system telehealth and informatics infrastructure to create a continuum of services for COVID-19 screening, testing, and treatment. *J Am Med Inform Assoc* 2020; 27: 1871–1877.
21. Robert Wood Johnson Medical School. About us, https://rwjms.rutgers.edu/community_health/project-echo/about-us (accessed 8 April 2021).
22. Myung S-K, McDonnell DD, Kazinets G, et al. Effects of web- and computer-based smoking cessation programs: meta-analysis of randomized controlled trials. *Arch Intern Med* 2009; 169: 929.
23. Perkins KA, Karelitz JL and Jao NC. Optimal carbon monoxide criteria to confirm 24-h smoking abstinence. *Nicotine Tob Res* 2013; 15: 978–982.
24. Kozlowski LT, Frecker RC and Fagerstrom KO. The Fagerstrom test for nicotine dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict* 1991; 86: 1119–1127.
25. Kang-Brown J and Subramanian R. Out of sight: The growth of jails in rural America. Report, Vera Institute of Justice, 2017.
26. Glover S, Moore CG, Probst JC, et al. Disparities in access to care Among rural working-age adults. *J Rural Health* 2004; 20: 193–205.
27. Deslich S. Telepsychiatry in correctional facilities: using technology to improve access and decrease costs of mental health care in underserved populations. *Perm J* 2013; 17: 80–86.
28. Anno BJ. Prison health services: an overview. *J Correct Health Care* 2004; 10: 287–301.
29. Doarn CR, Justis D, Chaudhri MS, et al. Integration of telemedicine practice into correctional medicine: an evolving standard. *J Correct Health Care* 2005; 11: 253–270.
30. UnitedHealth Center for Health Reform & Modernization. Modernizing rural health care: Coverage, quality and innovation. *UnitedHealth Group*, <https://www.unitedhealthgroup.com/viewer.html?file=/content/dam/UHG/PDF/2011/UNH-Working-Paper-6.pdf> (2011, accessed 8 April 2021).
31. Binswanger IA, Carson EA, Krueger PM, et al. Prison tobacco control policies and deaths from smoking in United States prisons: population based retrospective analysis. *Br Med J* 2014; 349: g4542–g4542.
32. Douthit N, Kiv S, Dwolatzky T, et al. Exposing some important barriers to health care access in the rural USA. *Public Health* 2015; 129: 611–620.
33. Ziller EC, Coburn AF and Yousefian AE. Out-Of-Pocket health spending and the rural underinsured. *Health Aff (Millwood)* 2006; 25: 1688–1699.
34. Hirko KA, Kerver JM, Ford S, et al. Telehealth in response to the COVID-19 pandemic: implication for rural health disparities. *J Am Med Inform Assoc* 2020; 27: 1816–1818.
35. Centers for Disease Control and Prevention. What are the risk factors for lung cancer? https://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm (2020, accessed 8 April 2021).
36. Senanayake B, Wickramasinghe SI, Eriksson L, et al. Telemedicine in the correctional setting: a scoping review. *J Telemed Telecare* 2018; 24: 669–675.
37. Edge C, Black G, King E, et al. Improving care quality with prison telemedicine: The effects of context and multiplicity on successful implementation and use. *J Telemed Telecare* 2021; 27: 325–342.
38. Dong Y and Peng CY. Principled missing data methods for researchers. *Springerplus* 2013; 2: 222.
39. American Lung Association. Cutting tobacco's rural roots: Tobacco use in rural communities. Report, American Lung Association, 2012.
40. Schulz TR, Kanhutu K, Sasadeusz J, et al. Using telehealth to improve access to hepatitis C treatment in the direct-acting antiviral therapy era. *J Telemed Telecare* 2018; 26: 180–185.
41. Ekeland AG, Bowes A and Flottorp S. Effectiveness of telemedicine: a systematic review of reviews. *Int J Med Inf* 2010; 79: 736–771.
42. Moffatt JJ and Eley DS. The reported benefits of telehealth for rural Australians. *Aust Health Rev, Publ Aust Hosp Assoc* 2010; 34: 276–281.
43. Speyer R, Denman D, Wilkes-Gillan S, et al. Effects of telehealth by allied health professionals and nurses in rural and remote areas: a systematic review and meta-analysis. *J Rehabil Med* 2018; 50: 225–235.