

Peer-Facilitated Tobacco Cessation in a Prison Setting: A Proof of Concept Study

Christine E. Garver-Apgar¹ , Chad M. Morris¹, Jim Pavlik¹, Tracy Lenartz² and Michele Hamm³

¹Department of Psychiatry, University of Colorado Anschutz Medical Campus, Aurora, CO, USA.

²Lenartz Consulting, Phoenix, AZ, USA. ³BridgeWell Consulting, Chandler, AZ, USA.

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ABSTRACT

BACKGROUND: Despite the vast human and economic costs associated with tobacco use among U.S. inmates, smoking remains a largely ignored public health epidemic. Incarcerated individuals smoke at 3 to 4 times the rate of the general population and face tobacco-related health disparities.

PURPOSE: This paper reports results from a single arm, pre/post pilot study designed to test the feasibility and initial effectiveness of an inmate-administered group tobacco cessation intervention within a men's pre-release program run by the Arizona Department of Corrections.

METHODS: Corrections staff and inmate peer mentors were trained in the DIMENSIONS: Tobacco Free Program, a manualized 6-session tobacco cessation group curriculum. Group sessions used evidence-based interventions for assisting inmates develop skills to live tobacco and nicotine free. In 2019-2020, 39 men who reported tobacco use voluntarily participated in one of three cessation groups. Wilcoxon signed-rank tests evaluated changes across group sessions in frequency of tobacco use and attitudes about nicotine-free living post release.

RESULTS: Most participants attended all six group sessions (79%) and made one or more quit attempts (78%). Overall, 24% of the sample reported quitting tobacco, and significant reductions in tobacco use were reported after only two sessions. Participants further reported significant positive changes in knowledge, plans, support, and confidence to live tobacco-free lives post-release.

CONCLUSIONS: To our knowledge, this is the first study to demonstrate that, with minimal investment, implementation of an evidence-based, peer-led tobacco free program is feasible and effective within an incarcerated population uniquely vulnerable to the burden of tobacco.

KEYWORDS: Tobacco Use, Tobacco Cessation, Peer-led Interventions, Priority Populations, Treatment and Intervention, Inmates

TYPE: Original Research Article

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CORRESPONDING AUTHOR: Christine E. Garver-Apgar, Department of Psychiatry, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

Introduction

The general prevalence of current cigarette smoking among U.S. adults is 14%,¹ but is estimated to be between 70%-80% for incarcerated individuals,² - a five-fold increase compared to the general population. The high rates of tobacco use among prisoners is likely attributable to the large demographic overlap between the corrections population and other health disparity populations that also have high rates of tobacco use, including persons living in poverty, those with lower levels of education, and individuals with mental illnesses and substance use disorders (SUD).³⁻⁶ Compared to women and older adults, men and younger adults also have higher rates of tobacco use, and these demographics are similarly over-represented in justice settings.³ Those who have been in prison also face a host of stressors that reinforce unhealthy behaviors, including unemployment, housing insecurity, low education, discrimination, exacerbated psychiatric symptoms, and family and social network dysfunction.^{7,8} Consequently, prisoners are at high risk for

relapse to smoking and disproportionately burdened with smoking-related chronic disease.⁹

Even incarcerated individuals who are released from facilities with tobacco-free policies go on to relapse to tobacco at rates upward of 98% after their incarceration ends.^{10,11} While tobacco use restrictions may support reductions and abstinence, smokers need behavioral and pharmacological supports pre and post release. Proven cessation services might not only increase inmates' health while imprisoned, but also increase the chances of staying abstinent post-release, integrating back into their communities, and avoiding unnecessary death and disability.¹²

When tobacco cessation interventions are provided in corrections settings, they have been found feasible, effective,^{13,14} and highly desired among inmates.¹⁵ Effective treatment addresses smoking as an addiction in coordination with other SUD treatment.^{7,16} Prison cessation programming that also includes Motivational Interviewing¹⁷ and intensive cognitive behavioral treatment has been shown to reduce post-release



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smoking relapse.^{18,19} Effective pre-release services include Medication Assisted Treatment which consists of a combination of behavioral support and FDA-approved cessation medications.^{13,18,20} Prison-based treatment instills optimism by establishing healthy coping skills¹⁰ and facilitates pre-release intentions to remain abstinent.²¹

Peer-to-peer criminal justice interventions may also encourage tobacco cessation pre- and post-release. Within other institutional settings such as psychiatric facilities, peers have successfully conducted community education and referral services²² and administered smoking cessation groups.²³⁻²⁵ And peers who had been formerly hospitalized for mental illness and trained to run cessation groups increased participants' confidence to quit.²⁶ Peer services in psychiatric treatment settings show promise for improving a range of health outcomes among mental health consumers with chronic medical comorbidities.²⁷ Inmates might be similarly instructed to offer treatment services, case management, support and advocacy, and role model healthy behaviors.²⁸ Inmates often have limited models of prosocial and non-smoking behavior among friends and family.²⁹ Non-smoking peers that have a shared lived experience might engage fellow inmates, and build trust, hope, empowerment, self-esteem, self-efficacy, social functioning, and life satisfaction.³⁰⁻³³

Responding to the critical need for tobacco cessation services in the criminal justice system, the Arizona Department of Health Services (ADHS) partnered with the Arizona Department of Corrections (ADC) to test a peer-facilitated, train-the-trainer cessation program, the DIMENSIONS: Tobacco Free Program within a state-run prison. This program has demonstrated effectiveness to reduce tobacco use and increase intent to quit among a statewide sample of individuals involved with Arkansas Community Correction.³⁴ The current study expands on this work in two important ways. First, whereas the previous study evaluated the program among individuals on probation or parole, the current study evaluated the uptake and outcomes of the DIMENSIONS program within an institutional setting, among a sample of soon-to-be-released incarcerated individuals. Second, the DIMENSIONS program was facilitated entirely by certified substance abuse counselors in the Arkansas Community Correction initiative, whereas the current quality improvement pilot project sought to evaluate the program as facilitated entirely by inmate peer mentors.

Methods

Background

The DIMENSIONS Tobacco Free manualized curriculum includes structured activities, educational handouts, and group discussion tailored specifically for individuals involved in the justice system. The DIMENSIONS curriculum is based on extensive review of the knowledge base and expert opinion for how best to intervene with this health disparity population. The curriculum includes evidence-based

strategies for motivational enhancement, wellness education, stress management and behavior change techniques, emotional support around tobacco quit planning, and allows clients to build tobacco-free social networks. The group has six 60- to 90-minute cycling sessions: 1) *Healthy Behaviors*, which provides general health and wellness education; 2) *The Truth about Tobacco*, a session devoted to exploring clients motivations to continue tobacco use and reasons to quit tobacco; 3) *Changing Behaviors*, which aims to help clients reorganize patterns of tobacco use and discover ways to change behaviors; 4) *Coping with Cravings*, which educates clients about nicotine addiction and helps them identify methods for coping with cravings; 5) *Managing Stress*, which gives clients additional stress management tools, other than tobacco use; and 6) *Planning Ahead*, a session geared toward preparing clients for potential future relapse situations and discussing the importance of planning ahead for high risk situations. DIMENSIONS has a trauma informed approach³⁵ and considers the needs of persons that have minority status, live in poverty or who are homeless, have low health literacy, may have cognitive impairment, are often isolated, and often distrust healthcare providers.

Participants

Participants were inmates incarcerated at Second Chance Center (SCC), Arizona's educational program for selected, soon-to-be-released inmates. SCC is a pre-release program and a state-run facility in which inmates who are nearing their release dates may choose from a variety of educational programs offered at the facility. These programs are designed to equip inmates with the skills and resources they will need to successfully reenter society. ADC and SCC are not tobacco-free institutions, and smoking and other tobacco products are allowed on campus. From December 2019 through March 2020, a total of 39 male inmates from the ADC, SCC voluntarily enrolled in one of three consecutive DIMENSIONS: Tobacco Free groups. Tobacco cessation groups were offered as one option among a menu of classes in which inmates could voluntarily choose to enroll. There were no exclusionary criteria for participating in tobacco free group sessions, and inmates did not need to commit to a quit date to participate. No financial or other incentives were given for participation in the DIMENSIONS: Tobacco Free groups. This study was a secondary analysis of a Department of Corrections Quality Improvement Initiative. Quality improvement studies, program evaluation studies, and retrospective studies are exempt from IRB review (Approved IRB Protocol #22-2380). Waiver of Consent was granted for this study. As tobacco cessation programming is considered an optional psychoeducational service, participants were not debriefed as would be expected for a research study. Rather, participants were free to discuss cessation progress or topics of concern with group facilitators or SCC staff at any time.

Supplementary Table S1 summarizes demographics and tobacco use among participants. All individuals involved with the program were men, and just over a quarter (26%) identified as Hispanic or Latino, while just over half (54%) identified as White. Almost the entire sample reported smoking cigarettes (95%) in the week preceding their first group session. As of the first session, over 70% of the sample reported smoking between 6 and 20 cigarettes (or using other forms of tobacco) per day. No individual reported using any form of FDA-approved tobacco cessation medications prior to the first group session, which would include any form of nicotine replacement therapy (NRT), bupropion, or varenicline.

Procedure

In November 2019, faculty from a whole health program housed in a medical school setting trained 21 ADC employees, inmate peer mentors, and state program evaluation consultants to become both DIMENSIONS: Tobacco Free Program trainers and facilitators. Peer facilitators were identified by SCC leadership and were required to be non-tobacco users, defined as never-smokers or ex-smokers with 6 months or more of continuous abstinence. Surveys to assess trainee satisfaction and their opinions of the presenters and training content were completed by 18 attendees. All 18 trainees “strongly agreed” or “agreed” that the presenters were knowledgeable and clearly presented key concepts, and 17 out of 18 “strongly agreed” or “agreed” that the presenters were engaging, that the training provided practical tools, and that they were satisfied with the training overall.

The SCC elected to run their first two classes with twice weekly sessions, for a total of three weeks per class. Their last class of this extended pilot ran once weekly, for a total of six weeks. All classes were organized and led by trained peer inmates. To bridge the transition from SCC to release, peer facilitators created a flyer with easy-to-follow steps for accessing continued NRT and coaching services from the state’s quitline and Medicaid healthcare clinics post-release. This flyer, along with other documents and information, were reviewed with program participants by a corrections officer upon release. All interested participants received NRT lozenges at no cost (ADHS supplied the NRT). Starting at the second or third session of each group, SCC staff managed distribution throughout the program duration, calculating a weekly dosage based on each participant’s previous week tobacco consumption.

Measures

At the end of each group session, participants completed a “Personal Progress Form” to track tobacco use over the course of the program. The one-page survey (which contained no identifying information) took about a minute to complete and included assessments of types and quantity of tobacco used, quit attempts, use and importance of NRT, as well as Likert-type

items to assess motivation, confidence, and support to abstain from tobacco post-release. Tobacco use frequency was defined as the number of cigarettes or other tobacco products used by participants in an average day over the preceding week, divided into 5 categories (None, 1-5, 6-10, 11-20, 21+). For purposes of calculating the quit rate, cessation was recorded if participants selected “none” from the categories listed above. Forms were collected at each site by the group facilitator and sent electronically in batches to the research team for data analysis. Group facilitators received training in professional standards, including the importance of maintaining confidentiality. As the research team received only de-identified forms, they did not have access to identifying participant information.

Data analyses

Data were analyzed using SPSS v.26.³⁶ Frequencies and percentages were calculated to summarize participant demographics and baseline tobacco use (**Supplementary Table S1**), as well as group attendance, quit attempts, and NRT use. We performed Wilcoxon signed-rank tests to evaluate changes across group sessions in participant tobacco use frequency (**Figure 1**) and attitudes about post-release cessation (**Figure 2** and **Supplementary Table S2**).

Results

Group attendance

Attendance at tobacco free group sessions was voluntary. Still, more than three quarters of the sample (79%; $n = 31$) attended all six tobacco free group sessions, and 90% of the sample (35 individuals) completed 5 out of 6 sessions. The final sample for analyses of outcomes includes individuals who attended at least 2 sessions, or 95% of the sample ($n = 37$). Two individuals attended only one session, and therefore are not included in analyses examining change over time.

Quit attempts

To characterize quit attempts, we computed the percentage of participants who made at least one or more quit attempt at some point during their group participation, as well as the most commonly reported duration of those quit attempts (i.e., < 1 day, 1-2 days, 3-7 days, or > 1 week) Seventy-eight percent of the group participants ($n = 29$) reported making at least one quit attempt during the course of their group attendance. Of those, just over half ($n = 16$ or 55%) reported making quit attempts during at least 3 of the weeks preceding a group session. Five individuals (17%) reported making quit attempts every week they participated in group sessions. When participants reported having made a quit attempt the previous week, they most often reported being able to quit for 1-2 days (reported for 36% of quit attempts). Another 26% of quit attempts reportedly lasted from 3 to 7 days, and one quarter lasted for less than one day.

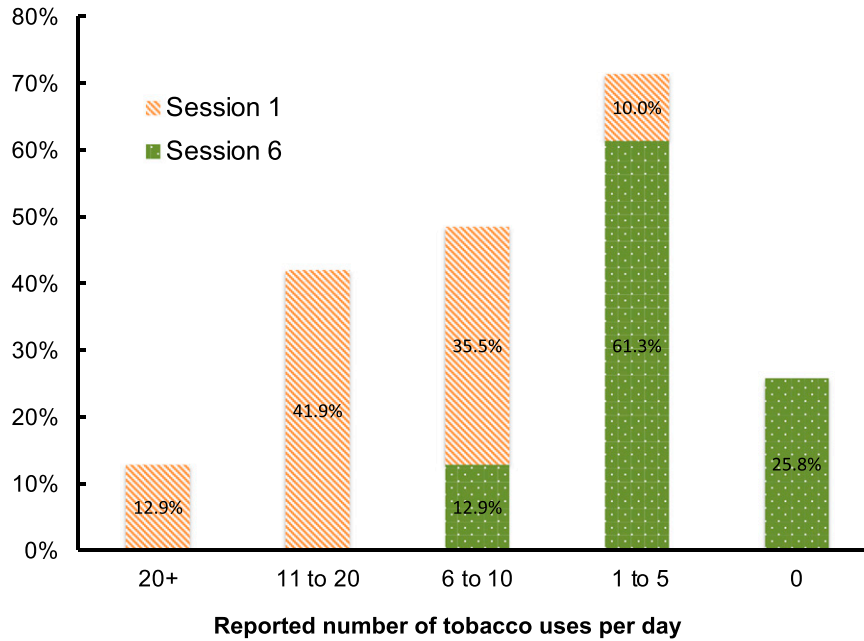


Figure 1. Percentage of participants reporting various tobacco use frequencies across Sessions 1 and 6 (n = 31; Z = -4.7; P < .001). Percentages reflect the movement of participants from categories of higher tobacco use in Session 1 to categories of lower tobacco use by Session 6. The percentage reporting 0 tobacco uses per day (25.8%, or 8 out of 31) is slightly different than the overall quit rate (24%, or 9 out of 37), as the former includes data from only those who attended all six sessions whereas the latter includes data from the entire sample.

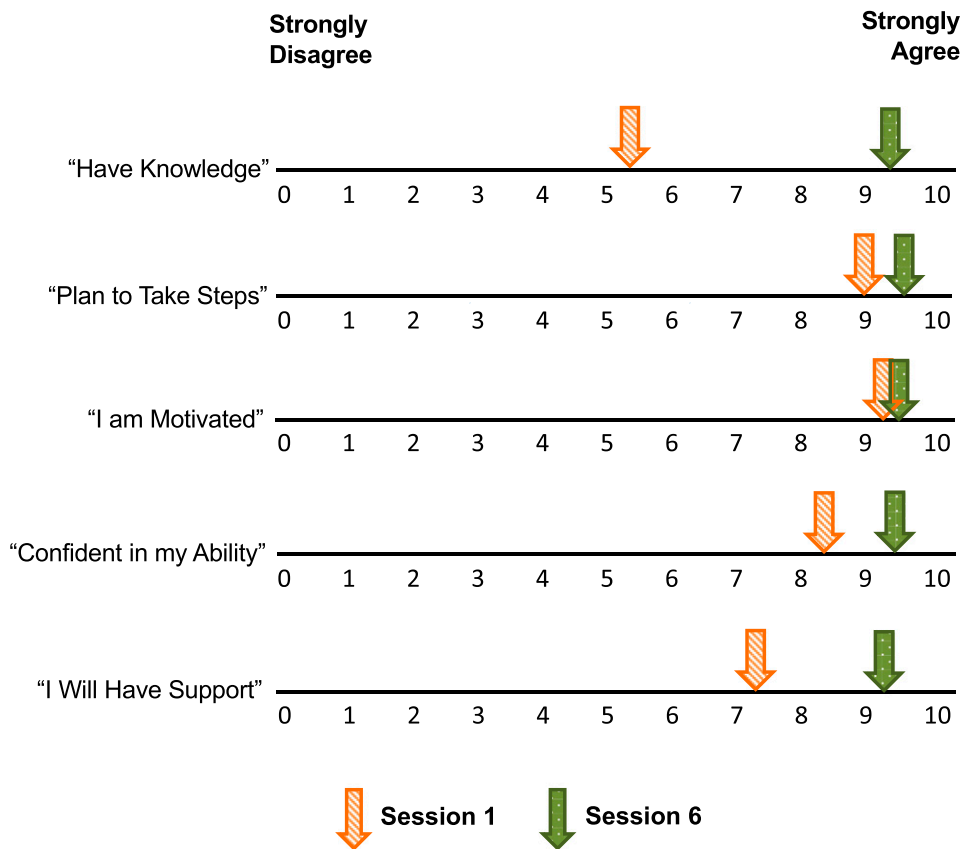


Figure 2. Change in "readiness to live a tobacco-free life" across 6 group sessions (n = 31). Arrows depict mean item responses, as we assume responses can be interpreted on an interval scale. Session 6 responses are significantly or marginally different from Session 1 responses for the following items: "I have the knowledge I need to live a tobacco-free life after my release," "I plan to take steps toward living a tobacco-free life after my release," "I am confident I have the ability to live a tobacco-free life after my release," and "I know I will have the support I need to live a tobacco-free life after my release."

Tobacco use over time

Across all three groups, the average quit rate was 24%. That is, nine out of 37 individuals reported no tobacco use over the preceding week by Session 6, and none who quit prior to Session 6 reported tobacco use for the duration of the group. To examine the efficacy of the tobacco free group curriculum to reduce tobacco use, we compared participant-reported frequency of tobacco use between Session 1 and Session 6 for participants who completed all six sessions ($n = 31$). A Wilcoxon signed-rank test revealed a significant difference across sessions in the frequency of tobacco use ($Z = -4.7, P < .001$) with a large effect size ($r = .60$). Compared to Session 1, participants at Session 6 reported using fewer tobacco products. Median tobacco use at Session 1 equated to smoking 11 to 20 cigarettes (or using other tobacco products) per day, compared to the median score at Session 6, which indicated tobacco use 1 to 5 cigarettes per day. [Figure 1](#) shows the changing frequency of tobacco use across six sessions.

To explore whether participants demonstrated reduced tobacco use after completing fewer tobacco free group sessions, we repeated the analysis with participants who completed only two or three sessions. We saw little evidence that attending a single session resulted in reduced tobacco use between Sessions 1 and 2 ($n = 36; Z = -1.7, P = .08$) with a small effect ($r = .20$). Median reported tobacco use was 11–20 cigarettes or other tobacco products per day at both Sessions 1 and 2. However, participants who attended three Tobacco Free group sessions significantly reduced their tobacco use ($n = 36; Z = -4.05, P < .001$) with a medium to large effect size ($r = .48$). By Session 3, only four participants (11% of the sample) reported they used tobacco more than 10 times per day over the preceding week, down from 50% of the sample (ie, 18 individuals) at Session 1, suggesting that just two sessions were effective at motivating behavior change in this sample.

Tobacco cessation medications

Out of 37 individuals attending multiple sessions, only 2 individuals did not take NRT during their group participation. (One of these attended only 2 sessions and likely quit the program before utilizing NRT). By Session 6 of the Tobacco Free group, participants on average reported “strongly agreeing” with the statement, “Having NRT available when I need it is important for helping me to live a tobacco-free life.” On a scale of 0 to 10, participants’ average response to this item was 8.9. All nine individuals who quit using tobacco over the course of their group participation reported using NRT during the group. Moreover, 8 of these individuals reported using NRT multiple times per day in the week or weeks leading up to successful cessation (as opposed to once per day or less than once per day).

Post-release intentions

To determine whether participants reported a positive shift in readiness to abstain from tobacco use post-release, we compared participants’ responses to five Likert-type items across group sessions, assessed on a scale from 0–10, where 0 = Strongly Disagree and 10 = Strongly Agree. As shown in [Figure 2](#), a comparison of responses at Session 1 and Session 6 among the subsample of participants who completed all 6 sessions ($n = 31$) revealed increased readiness to live a tobacco-free life post-release. Wilcoxon signed-rank tests found significant or marginally significant movement along the scales for the following items: “I have the knowledge I need to live a tobacco-free life after my release,” “I plan to take steps toward living a tobacco-free life after my release,” “I am confident I have the ability to live a tobacco-free life after my release,” and “I know I will have the support I need to live a tobacco-free life after my release” (See [Supplementary Table S2](#)).

Discussion

Given the tobacco-related health disparities incarcerated individuals face, there is a pressing need for research on best smoking cessation practices for those currently in jails and prisons. To our knowledge, this study offers the first evidence that peer-facilitated cessation programming is effective and feasible for incarcerated individuals. In light of the advantages offered by peer-facilitated programming over correctional staff- or other professionally-led programming (namely cost effectiveness and sustainability) larger-scale efficacy trials are warranted.

As evidenced by inmates’ voluntary participation and the fact that groups were run at or approaching capacity, there was significant interest in pre-release tobacco cessation support. This finding was compelling given that there were no internal incentives or penalties for group participation or completing the entire group series. More than three-quarters of the individuals completed all six group sessions, and those who attended groups demonstrated significant reductions in tobacco use. After attending two or more sessions, there was detectable change in tobacco use among participants. By the third session, nearly 80% of the sample reported making at least one quit attempt over the course of group participation, and a quarter of the sample reported successful cessation. The curriculum offered flexibility that allowed SCC staff to coordinate groups with entry and release dates, manage available classroom space, and respond in real time to changes suggested by peer facilitators. For example, the groups were run as closed groups and the facilitator tested having the group participants set their individual quit date at the same time which may have led to higher overall quit rates.

Participants, peer facilitators, and SCC leadership all reported the importance of NRT at no cost in supporting reducing and quitting tobacco use. Most stated that while access to NRT is very important, the cessation classes could still be successful without it. Lack of funding for NRT in institutional

settings is a perennial issue. For this pilot program, the state health department provided NRT with the understanding that ADC would determine how to sustain cessation pharmacotherapy. Meeting this agreement, SCC is seeking an ongoing budget allocation for NRT. SCC has presented a cost analysis to ADC leadership which includes potential models whereby ADC covers the full NRT cost, there is cost sharing with inmates, or NRT is available for inmates to buy through the commissary.³⁷ These models were presented as equitable to the costs for existing SCC self-improvement programming. As a critical argument for funding the program, SCC has outlined the extremely high prevalence of tobacco use and other drug use, making the case that all addictions need to be treated to reduce drug-related recidivism. That is, individuals with SUD generally must develop new coping strategies and adopt healthy life choices to replace unhealthy behaviors, or the chance of worsening drug use or relapse is extremely high.³⁸

DIMENSIONS addressed the need to develop coping skills that may generalize across polysubstance use. Group participants reported increased knowledge about tobacco use and confidence in abstaining from tobacco upon release. Prior research has shown that pre-release intentions are associated with post-release abstinence.^{10,21,29} This highlights the need to have a continuum of pre- and post-release Medication Assisted Treatment. Slips and relapses are common and warrant dosages of behavioral treatment and pharmacotherapy that meet individual levels of tobacco dependency.^{20,39,40} One potential available support post-release is the state quitline, which provides some level of telephonic counseling, pharmacotherapy, and online and texting resources at no cost.⁴¹ Through minimal training, existing quitline coaches might assist in meeting the cessation needs of individuals leaving jails and prisons.⁴² ADC might also build partnerships with community-based organizations such as Medicaid health service agencies where recently released inmates typically have their first healthcare appointments. These healthcare agencies might also be trained to deliver DIMENSIONS allowing released offenders to either start or continue to take advantage of the same cessation resources.

This pilot further demonstrated that trained peers are effective group champions and facilitators. Peer facilitation addressed existing workforce shortages and staff's competing demands. Within this institutional setting, peer facilitation offered additional logistical advantages over employing external facilitators. For example, Tobacco Free groups were offered continuously over the winter holiday period in December and early January. This continuity of programming, especially important in correctional settings, would not have been possible if the SCC had relied on external program facilitators. Results support that peer specialists can be an integral component of a self-improvement educational team and might accelerate care by engaging tobacco users in a culturally sensitive manner. Past studies find that peer interventions increase trust, engagement, hope, social functioning, and life satisfaction, while decreasing

hospital or institutional care.⁴³⁻⁴⁵ Peer-driven care has further been demonstrated to be cost-effective in comparison to traditional health care services.^{45,46} SCC leadership affirmed previous findings reporting that the pilot project demonstrated that peer facilitators could make DIMENSIONS a sustainable program and furthermore, offer these facilitators a unique opportunity to help others while building valuable and transferable employment skills upon release.³⁷

There are limitations to the present study. An inherent limitation to any large-scale, community-based intervention such as this one is that variations may exist across sites related to fidelity to the program or other methodological details. Although we are not aware of any systematic departures from fidelity to the DIMENSIONS: Tobacco Free Program model, this limitation should be considered. We relied on self-report for measurement of most variables. There was no biologic testing of tobacco use. However, there is evidence that self-reported health information in incarcerated populations can be reliable.⁴⁷ We did not compare participant outcomes with those of a control group; thus, we cannot rule out the possibility that improvements observed over the course of the project were not a result of other factors unknown to the researchers. There was clearly selection bias as group participation was voluntary. Those participating likely had more motivation to reduce or quit their tobacco use; thus, results of this program evaluation cannot generalize to other pre-release programs. As this was a secondary analysis of existing data, there are several questions we were unable to address. First, we were unable to examine the extent to which initial programmatic interest and engagement drove tobacco reduction results. For example, we could not assess the rate of initial programmatic uptake, as we do not know the total number of people residing at the SCC who reported tobacco use when recruitment for each group took place. Similarly, data were not available regarding participants' quit histories, their initial willingness to quit when considering the program, and specific reasons for absences from group sessions. The present investigation could not identify potential effects of smoker characteristics on program success. Participants were all male inmates, and it is unknown if female inmates would have responded similarly to cessation programming. Finally, results may not generalize to other correctional settings, where demographic indicators such as race and ethnicity may differ markedly.

Future research on tobacco cessation efforts among justice-involved individuals would benefit from examining potential moderators such as sex, smoking history, tobacco dependence, motivation to quit, and other physical and mental health indicators that could influence successful tobacco cessation. This work is important because it would serve to better identify individuals for whom this type of intervention is most effective. The ability to track tobacco use over an extended post-release period would also add significantly to the current knowledge base.


Conclusion

Most tobacco users who are imprisoned report wanting to quit smoking and would participate in a cessation program.^{15,48} There is a clear need for further research to identify effective strategies for reducing smoking while incarcerated but also maintaining reductions and abstinence after release. These preliminary findings suggest that completion of two or more DIMENSIONS sessions combined with NRT are effective at motivating reductions in smoking for a pre-release men's prison program. The novel use of inmate peer facilitators may be a pathway toward sustainable and cost-effective corrections cessation services.

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ORCID iD

Christine E Garver-Apgar  <https://orcid.org/0000-0001-9556-8173>

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