



Contents lists available at ScienceDirect

Drug and Alcohol Dependence Reports

journal homepage: www.elsevier.com/locate/dadr

Implementing tobacco-free policy in residential substance use disorders treatment: Practice changes among staff

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ARTICLE INFO

Keywords:

tobacco-free policy
tobacco cessation
substance use treatment

ABSTRACT

Introduction: Implementing tobacco-free policies in substance use disorders (SUD) treatment may reduce tobacco-related, health disparities. This study examined adoption of tobacco-related policy and practices in six residential programs participating in a California-sponsored, 18-month, tobacco-free policy intervention.

Methods: Directors (N=6) completed surveys of tobacco-related policies before and after the intervention. Staff completed cross-sectional surveys assessing tobacco-related training, beliefs, practices, workplace smoking policy, tobacco cessation program services, and smoking status pre- (n=135) and post-intervention (n=144).

Results: Director surveys indicated no programs had tobacco-free grounds, one provided tobacco-related staff training, and two provided nicotine replacement therapy (NRT) pre-intervention. At post-intervention, 5 programs had implemented tobacco-free grounds, 6 provided tobacco cessation training, and 3 provided NRT. Across all programs, staff were more likely to report smoke-free workplaces (AOR = 5.76, 95% CI 1.14, 29.18) post- versus pre-intervention. Staff positive beliefs towards addressing tobacco use were higher post-intervention (p<0.001). Odds of clinical staff reporting tobacco-related training participation (AOR = 19.63, 95% CI 4.21, 27.13) and program-level provision of NRT (AOR = 4.01, 95% CI 1.54, 10.43) increased post- versus pre-intervention. Clinical staff reporting they provided tobacco cessation services were also higher post-intervention (p= 0.045). There were no changes in smoking prevalence or quit intention among smoking staff.

Conclusion: A tobacco-free policy intervention in SUD treatment was associated with implementation of tobacco-free grounds, tobacco-related training among staff, more positive staff beliefs towards and delivery of tobacco cessation services to clients. The model may be improved with greater emphasis on staff policy awareness, facilitating availability of NRT, and reducing staff smoking.

1. Introduction

Cigarette smoking among adults in the United States (US) has declined over the last several decades from a rate of 20.9% in 2005 to 14.0% in 2019 (Cornelius, Wang, Jamal, Loretan, & Neff, 2020; Jamal et al., 2016). However, smoking prevalence remains high among individuals with substance use disorders (SUDs). Between 2015 and 2020, rates from 77% to 92.2% were reported in SUD samples (Akhtar et al., 2020; Gwydish et al., 2019). This disparity in smoking prevalence is associated with high rates of tobacco-related illness and mortality among those with SUDs (Leventhal, Bello, Galstyan, Higgins, & Barrington-Trimis, 2019; Schroeder & Morris, 2010). Approximately 36-49% of deaths among individuals with SUDs are attributable

to tobacco-related illness, a tobacco-related mortality rate that is considerably higher than the general population (Bandiera, Anteneh, Le, Delucchi, & Gwydish, 2015; Callaghan, Gatley, Sykes, & Taylor, 2018).

The SUD treatment field has recognized the need to address tobacco use among individuals who enter treatment. Recommendations have included implementation of tobacco-free policies, staff training in treating tobacco use disorder (TUD), and providing tobacco cessation treatment, all of which have been included in clinical practice guidelines for addressing TUD, developed through a collaboration of governmental and nonprofit organizations (Fiore et al., 2008). Each of these interventions has a developing evidence base. Tobacco-free policy implementation has been associated with decreased client smoking rates (Gwydish, Yip, et al., 2017a; Richey, Garver-Apgar, Martin, Morris, & Morris, 2017).

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<https://doi.org/10.1016/j.dadr.2022.100033>

Received 11 September 2021; Received in revised form 12 February 2022; Accepted 15 February 2022

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Staff training has been associated with higher delivery of smoking cessation treatment (Knudsen, Studts, & Studts, 2012). Smoking cessation interventions, particularly nicotine replacement therapy (NRT), behavioral treatment, and combined approaches have been shown to increase smoking cessation during SUD treatment (Thurgood, McNeill, Clark-Carter, & Brose, 2016). In 2016, only 34.5% of SUD treatment facilities nationwide reported tobacco-free grounds and 47.4% reported offering smoking cessation counseling (Marynak et al., 2018).

Successful implementation of tobacco-free policies and delivery of tobacco cessation services in SUD treatment depends, in part, on staff policy awareness, attitudes and practices. Staff commitment to implementing tobacco-free practices predicted the extent to which implementation later occurred as perceived by staff (Eby & Laschober, 2014). Positive attitudes towards treating tobacco use, self-perceived competence in doing so, and higher levels of tobacco cessation treatment skills have been associated with increased delivery of tobacco-cessation services (Eby, Laschober, & Muilenburg, 2014; Martínez et al., 2017). Conversely, staff who smoke appear less likely to provide tobacco-related services (Laschober, Muilenburg, & Eby, 2015) and may underestimate client interest in quitting smoking (Skelton et al., 2017), although some reports have not found associations between staff smoking and provision of tobacco services (Knudsen et al., 2012; Olsen, Alford, Horton, & Saitz, 2005). Implementation of tobacco-free policies may influence smoking behavior among staff, as well as clients, and the research on implementing tobacco cessation services in SUD treatment highlights the importance of addressing staff beliefs, training, and practices (Gentry, Craig, Holland, & Notley, 2017; Guydish, Passalacqua, Tajima, & Manser, 2007; Knudsen, 2017; Siegel et al., 2021).

Statewide initiatives play an important role in addressing tobacco use in SUD treatment in the US. State policies directed New Jersey (Williams et al., 2005), Oregon (Drach, Morris, Cushing, Romoli, & Harris, 2012), New York (Brown, Nonnemaker, Federman, Farrelly, & Kipnis, 2012), and Utah (Marshall, Kuiper, & Lavinghous, 2015) to implement tobacco-free grounds (TFG) in state-funded, SUD programs. In Texas, an academic-community partnership implemented TFG in state-funded, behavioral health and SUD programs despite the absence of state regulatory requirements (Correa-Fernández et al., 2019). Evidence of implementation sustainment has been reported for the New Jersey (Foulds et al., 2006) and Texas programs (Correa-Fernández et al., 2019). Implementation of the New York initiative was associated with a significant decrease in client smoking from 69.4% to 62.8% at one year (Guydish, Tajima, et al., 2012).

In 2018, the California Tobacco Control Program (CTCP) sponsored an initiative to reduce tobacco use and associated health disparities in residential, behavioral health programs (CTCP, 2018). The Tobacco Free for Recovery (TFR) intervention, led by the University of California San Francisco Smoking Cessation Leadership Center (SCLC), assisted programs in implementing tobacco-free policies, tobacco cessation staff training, and tobacco cessation services to clients. Wellness-oriented policies that promoted healthy alternatives to smoking, such as exercise and modifying smoking areas for other activities were included in the intervention. SCLC consultants worked with programs to develop individually tailored, policies and procedures to achieve these goals over an 18-month period. Evaluation of clinical outcomes showed that the TFR intervention was associated with a significant reduction in client smoking prevalence (McCuistian et al., 2021).

The current study assessed adoption of tobacco-free policies and changes in staff tobacco-related practices from pre- to post-intervention in six participating programs. Program directors completed policy surveys pre and post intervention. Cross-sectional surveys regarding tobacco-related beliefs, policies, practices and staff smoking were collected from staff pre- and post- intervention. The study summarizes program directors' pre- and post-intervention reports of tobacco-free facilities, tobacco-related staff training and tobacco cessation treatment for clients. The study also reports on pre- post-intervention differences in staff tobacco-related training participation, beliefs and

practices, awareness of tobacco-free policy and tobacco cessation program services, as well as self-reported smoking status and quit intentions.

2. Methods

2.1. Program selection

The CTCP advertised the TFR initiative through its network of tobacco control partners in California. Residential behavioral health programs with a minimum 20-bed capacity were eligible for participation. Six eligible programs submitted letters of intent, completed applications and received \$36,000 contracts from the CTCP. All participating programs were licensed, residential SUD treatment programs with a 24-to185-bed capacity.

2.2. Policy intervention

Contractual goals for each program included: (1) write and implement policies prohibiting tobacco use on program grounds for all clients and staff (i.e., TFG), (2) assess and treat client tobacco use with staff trained to provide tobacco cessation services, and, (3) implement wellness policies that support tobacco-free environments (e.g., re-purposing smoking areas for exercise).

Intervention procedures for each program included: (a) evaluating existing tobacco-related policies and completing needs assessments regarding tobacco-free implementation, (b) attending initial meetings with representatives from the CTCP and the SCLC consultants, (c) identifying project leads, (d) meeting monthly with SCLC consultants to develop tobacco-related policies and action plans, and, (e) meeting quarterly with representatives from all participating programs to discuss progress, challenges and to share lessons learned. SCLC consultants provided resources including templates of implementation plans for tobacco-free grounds, access to external advisors regarding wellness policy development, and tobacco cessation training conducted with staff in participating programs.

2.3. Participants

The program director from each participating program completed director surveys pre - and post-intervention. All full and part-time, paid staff at each program employed during either of the data collection periods were eligible to complete staff surveys. Pre- and post-intervention survey collection took place between December 2018 and June 2020.

2.4. Survey administration procedures

Pre-intervention surveys for both directors and staff were completed prior to the start of the intervention for each program. Post-intervention surveys for directors and staff were collected at approximately 18 months (mean number of days = 483). Survey procedures were the same for pre- and post- intervention data collection.

Directors were invited to complete confidential, self-administered, online surveys which began with an informed consent form. Upon completion of the survey, directors received a \$50 gift card. Directors also reported specific dates of TFG policy implementation to SCLC intervention consultants.

Data collection for staff surveys was cross-sectional. Staff members who completed surveys at both timepoints had their responses linked through research ID numbers. At each data collection period, eligible staff were invited to participate in the study using work email addresses provided by program directors. The surveys contained a study description and an informed consent form. Consenting participants completed confidential, online surveys. Respondent email addresses were used to send \$25 gift cards and track response rates. Up to 4 weekly reminders

were sent following the initial invitation in order to facilitate participation.

Following restrictions imposed in March 2020 due to the COVID pandemic (California, 2020), procedures for the post-intervention survey were changed for one program at its request. There, staff ($n = 48$) completed a shorter, paper version of the survey. All questions used in this analysis were included in both the online and paper surveys. Research staff provided paper surveys in envelopes to program directors for distribution. Staff were identified by name on the envelopes and by staff ID only on the surveys. Participating staff returned completed surveys in their respective envelopes to program directors who mailed them to the research team. Staff who completed surveys received a \$25 gift card. All study procedures were approved by the institutional review board of the University of California, San Francisco.

2.5. Measures

2.5.1. Director survey

At both pre- and post-intervention, directors were asked to report on tobacco-related policies and practices using items modified from a previous survey (Muilenburg, Laschober, Eby, & Moore, 2016). Items used for this analysis asked whether programs offered tobacco-related staff training and the following tobacco cessation services to clients: referral to smoking cessation specialists, education classes, support group, advice to quit smoking, NRT. Responses options were yes/no/ not sure. A small proportion (4.8%) of director survey responses, were given as “not sure,” and were coded as “no” for this analysis.

2.5.2. Staff survey

There were 31 items from the staff survey used in the current study. All were present on both survey versions and were administered at both data collection periods. All staff completed questions about demographics, job duties, beliefs about addressing tobacco use in SUD treatment, workplace smoking policy, and their own smoking status. Clinical staff also completed items regarding participation in tobacco-related training, their provision of tobacco-related clinical services and their program’s provision of such services.

Demographic items assessed age, gender, race/ethnicity, and education. All staff were asked about clinical contact with clients, caseloads, and provision of counseling. Clinical staff were defined as those who reported having clinical contact with clients and either a current active caseload or having conducted counseling within the past week.

All staff were asked to report the current workplace smoking policy for staff (no smoking allowed [anywhere/anytime], smoking allowed, or I don’t know response options). They were asked their current cigarette smoking status, (i.e., “Do you currently smoke cigarettes?” with response options: yes/ no, I quit/ no, never) and whether they had smoked at least 100 cigarettes in their lifetime. Current smoking was defined as reporting current smoking and lifetime smoking of at least 100 cigarettes. Current smokers were also asked if they were seriously thinking of quitting smoking, coded as yes, within 30 days, or no (if not within 30 days).

The survey assessed beliefs about and practices of addressing tobacco use employing two scales from the Smoking-Knowledge, Attitudes, and Practices instrument (S-KAP; Delucchi, Tajima, & Guydish, 2009). The 7-item Beliefs scale (Cronbach’s $\alpha = 0.74$), completed by all staff participants, assessed beliefs regarding the benefits of addressing tobacco use and providing tobacco cessation interventions to clients. Clinical staff participants were administered an 8-item version of the Practices scale ($\alpha = 0.92$) regarding tobacco-related, treatment services they provide. Item responses for both scales are rated from 1 to 5, with additional options, N/A, and decline to answer. Higher numerical ratings indicate more positive beliefs about addressing smoking and higher levels of delivery of tobacco cessation practices. The mean of item response ratings comprised each scale score. S-KAP Beliefs and Practices scale items, response options and response rating codes are shown in Fig. 1.

The survey asked clinical staff whether they had participated in tobacco cessation training in the past 12 months (y/n/I don’t know). Additionally, clinical staff were asked to identify tobacco cessation services that were offered to clients by their treatment program (i.e., program services) from a list of options. Response options were grouped into in three categories for our analysis: a) education classes/support groups/counseling/psychotherapy, b) quit line/referral, and c) nicotine replacement therapy.

2.6. Data analyses

Frequencies were used to summarize directors’ reports of TFG, staff tobacco-related training and tobacco cessation program services for the 6 participating programs. Regarding staff surveys, 135 staff completed baseline surveys and 144 completed post-intervention surveys. Among staff who completed baseline surveys, 45% ($n = 61$) also completed 18-month surveys. Because the samples included some staff completing surveys at both data collection periods, the samples were not fully independent, thus unadjusted comparisons for demographics or outcome variables across time were not conducted. Descriptive statistics were used to summarize staff demographic characteristics (age, gender, race/ethnicity, education) and clinical vs. non-clinical status of all participants at pre- and post-intervention, with frequencies and percentages for categorical variables and means with standard deviations (SD) for continuous variables. Descriptive statistics also summarized staff-reported outcome variables at baseline and post-intervention. There were 9 outcome variables, 4 using data from all staff (S-KAP Beliefs, work place smoking policy, staff smoking, and quit intention) and 5 using clinical staff responses (tobacco-related training participation, S-KAP Practices and 3 types of tobacco cessation program services - classes/counseling, NRT, and quitline referral).

Multivariate regression models were used to assess pre- post-intervention differences in outcome variables. There were 9 models, one for each outcome variable. All models adjusted for age, gender, race/ethnicity, and education. The models also adjusted for correlated observations among staff who completed surveys at both data collection periods and accounted for nesting of staff within programs. “I don’t know” responses were counted as missing and excluded from the analyses. Generalized estimating equations with logit link were used for dichotomous outcomes, and mixed-effects regression models were used for continuous outcomes.

Sensitivity analyses were conducted with two subsets of staff. First, multivariate regression analyses were repeated using the sample of staff ($n=61$) who completed both baseline and post-intervention surveys. These analyses were conducted for all outcome variables except current smoking and quit intention, excluded from the sensitivity analyses due to the small number of smoking staff (9 at baseline, 5 post-intervention). Second, multivariate analyses were repeated for three outcomes (current staff smoking, quit intention among smoking staff, and workplace smoking policy) using the sample of staff from the five programs ($n = 111$ at baseline, $n = 117$ at 18-months) that reported successful implementation of TFG post-intervention.

Because the rate of missing data was low (all of the models had missing data <2.5%, except for work place smoking policy and Practices scale for which the missing rate were 6.1% and 6.9%, respectively), the multivariate models used complete case analysis. SAS version 9.4 was used to conduct the analyses.

3. Results

3.1. Director reports

Director reports of tobacco-related policies and services pre- and post-intervention are shown in Table 1. All programs reported increases in TFG (0 to 5 programs), tobacco-related staff training (1 to 6 programs), and tobacco-cessation client services. The largest increase in

1	If a patient has been in recovery from alcoholism for less than 6 months, quitting smoking would threaten their sobriety*	1 = Strongly Disagree 2 = Disagree 3 = Unsure 4 = Agree 5 = Strongly Agree
2	Smoking cessation counseling is an important part of my agency's mission	
3	Counseling by a clinician helps motivate smokers to quit	
4	Clinicians should make appointments specifically to help patients quit	
5	Smoking is a personal decision which does not concern the clinician*	
6	In your opinion, what is the best point to encourage clients to stop smoking?	1 = Never 2 = After 1 year of treatment 3 = After 6 months of treatment 4 = After 3 months of treatment 4 = After 1 month of treatment 5 = As soon as they begin treatment
7	In your opinion, for clients who use drugs and smoke cigarettes, which should come first?	1 = Quit using drugs 3 = Quit smoking 5 = Quit smoking and using drugs at the same time

*This Item is reverse coded (i.e., 1= Strongly Agree to 5= Strongly Disagree)

Practices

1	In the past month, how frequently did you ask your patients whether they smoked	1 = Never 2 = Occasionally 3 = Often 4 = Very Often 5 = Always
2	In the past month, how frequently did you advise patients who did smoke to quit	
3	In the past month, how frequently did you assist patients who wanted to stop smoking with referrals and advice to quit	
4	In the past month, how frequently did you arrange a follow up visit or phone call to discuss quitting?	
5	In the past month, how frequently did you encourage patients who smoke to stop smoking completely?	
6	In the past month, how frequently did you encourage patients who smoke to use nicotine replacement	
7	In the past month, how frequently did you encourage patients who smoke to reduce smoking to five or fewer cigarettes per day, if patient stated they could not quit	
8	In the past month, how frequently did you encourage patients who smoke to not smoke in the presence of infants or children?	

Fig. 1. Scale items and response codes for staff tobacco-related beliefs and practices scales Beliefs

*This Item is reverse coded (i.e., 1= Strongly Agree to 5= Strongly Disagree) Practices

Table 1
Director reports of tobacco-related policy and services in California residential substance use treatment programs pre- and post-tobacco-free policy intervention

	Policy/Services Implemented (Y/N)	
	Pre-intervention (N=6)	Post-intervention (N=6)
Tobacco-free grounds	0	5
Tobacco-related staff training	1	6
Tobacco cessation services		
Referral to smoking cessation specialists	24232	66563
Education classes		
Support group		
Provide advice to quit smoking		
Nicotine replacement therapy		

Table 2
Demographic characteristics of staff in California residential substance use treatment programs pre- and post-tobacco-free policy intervention

	Pre-intervention (N=135)	Post-intervention (N=144)
Age	45.0 (13.03)	44.8 (12.60)
Gender		
Male	55 (41.0%)	69 (48.3%)
Female	79 (59.0%)	74 (51.7%)
Race/ethnicity		
Hispanic/Latino	50 (37.0%)	59 (41.0%)
Black or African American	29 (21.5%)	31 (21.5%)
Non-Hispanic White	42 (31.1%)	39 (27.1%)
Multiracial/other	14 (10.4%)	15 (10.4%)
Education level		
No High School Diploma/Equivalent	4 (3.0%)	4 (2.8%)
High School Diploma/Equivalent	23 (17.2%)	25 (17.7%)
Some College/Associate degree/Technical/Trade school	73 (54.5%)	78 (55.3%)
Bachelor's Degree	15 (11.2%)	20 (14.2%)
Master's Degree	19 (14.2%)	14 (9.9%)
Clinical staff	74 (55.2%)	70 (50.0%)

client services occurred for referral to smoking cessation specialists (2 to 6 programs), while the smallest reported increase was for NRT provision (2 to 3 programs).

3.2. Staff demographic characteristics

There were 165 eligible staff members across all programs at baseline, and 176 eligible at 18-months. Response rates were 82% at both time periods with 135 staff completing baseline surveys and 144 staff completing post-intervention surveys. Among all staff completing the survey, 55.2% were clinical staff at baseline and 50% were clinical staff at 18 months [Table 2](#). presents staff demographic characteristics.

3.3. Frequencies for staff-reported outcome variables pre- and post-intervention

S-KAP scale scores reflecting positive beliefs about addressing smoking increased pre- to post-intervention ([Table 3](#)). Percentages of staff in the total sample reporting workplace smoking bans rose from 22.8% pre- to 56.8% post-intervention. These proportions were higher for the 5 programs that implemented TFG, 24.5%, and 65.5% respectively. Clinical staff reporting tobacco-related training participation increased from 8.3% pre-intervention to 60.9% post-intervention. Clinical staff reports of providing tobacco cessation services (S-KAP Practices) also increased, as did their reports that their program offered tobacco-cessation counseling, quit line/referral, and/or NRT. Staff smoking prevalence was 17.8% pre- and 17.4% post-intervention. Intention to quit within 30 days among smoking staff increased pre- to post-intervention, 29.2% to 40.0% respectively.

3.4. Pre- versus post- intervention comparisons

3.4.1. All staff beliefs about addressing smoking in SUD treatment and work place smoking policy

Multivariate regression models of pre-post- differences in S-KAP Beliefs and workplace smoking policy are shown in [Table 4](#). Differences between post-intervention and baseline in tobacco-related Beliefs were significant (adjusted mean difference = 0.29, 95% CI 0.15, 0.44), indicating post-intervention increases in positive beliefs about addressing tobacco use. Staff reporting that no smoking was allowed at work was significantly more likely post-intervention compared to baseline (AOR =5.76, 95% CI1.14,29.18).

3.4.2. Clinical staff tobacco-related training, tobacco cessation practices, and program services

The odds of clinical staff reporting participation in tobacco-related training in the past 12 months were significantly higher post-intervention (AOR = 19.63, 95% CI 14.21, 27.13) compared to baseline. Differences between post-intervention and baseline S-KAP Practices (adjusted mean difference = 0.38, 95% CI 0.01, 0.76) were also significant, indicating post-intervention increases in clinical staff delivering tobacco cessation services. The odds of clinical staff reporting that their program provided NRT to clients were significantly higher at post-intervention (AOR = 4.01, 95% CI 1.54, 10.43) than baseline. There was no difference from pre- to post-intervention in staff reports of program-level, tobacco cessation counseling-related services to clients ([Table 4](#)).

3.4.3. Staff smoking and quit intentions

Comparisons showed no differences in staff smoking prevalence from pre to post intervention. There was also no change in quit intention among smoking staff ([Table 4](#)).

Table 3
Staff reports of tobacco-related training, beliefs, practices, staff smoking and quit intentions in California residential substance use treatment programs pre- and post-tobacco-free policy intervention

	Pre-intervention	Post-intervention
All staff¹		
S-KAP Beliefs scale	3.4 (0.65)	3.7 (0.61)
Smoke-free workplace policy		
<i>Total staff sample¹</i>		
No smoking at work (anywhere, anytime)	29 (22.8%)	79 (56.8%)
Smoking allowed	98 (77.2%)	60 (43.2%)
<i>Staff sample at TFG program²</i>		
No smoking at work (anywhere, anytime)	26 (24.5%)	74 (65.5%)
Smoking allowed	80 (75.5%)	39 (34.5%)
Staff smoking	24 (17.8%)	25 (17.4%)
Quit intention within 30 days ³	7 (29.2%)	10 (40.0%)
Clinical staff⁴		
Tobacco-related training participation	6 (8.3%)	42 (60.9%)
S-KAP Practices scale	2.6 (1.10)	3.0 (1.09)
Tobacco cessation, program services - Classes/counseling	39 (52.7%)	52 (74.3%)
Tobacco cessation, program services - Nicotine replacement therapy	20 (27.0%)	41 (58.6%)
Tobacco cessation, program services – Quitline referral	19 (25.7%)	32 (45.7%)

¹ All staff (pre-intervention N = 135, post-intervention N = 144)
² All staff at TFG programs (pre-intervention N = 111, post-intervention N = 117)
³ Current smoking staff (pre-intervention N = 24, post-intervention N =25)
⁴ Clinical staff (pre-intervention N= 74, post-intervention N =70)

Table 4
Multivariable regression models of comparisons in staff reports of tobacco-related training, beliefs, practices, staff smoking and quit intentions in California residential substance use treatment programs pre- and post-tobacco-free intervention¹

	Post-intervention vs. Pre-intervention (Whole sample)		Post-intervention vs. Pre-intervention(Subset completing both pre- and post-surveys)	
	Odds Ratios/Means Difference (95% CI) ²	p value	Odds Ratios/Means Difference (95% CI) ²	p value
All staff³				
S-KAP Beliefs scale	0.29 (0.15, 0.44)	<0.001	0.42 (0.21, 0.64)	<0.001
Smoke-free workplace policy	5.76 (1.14, 29.18)	0.034	5.86 (1.17, 29.37)	0.032
Staff smoking	0.92 (0.65, 1.30)	0.618		
Quit intention within 30 days ⁴	1.46 (0.43, 4.92)	0.539		
Clinical staff⁵				
Tobacco-related training participation	19.63 (14.21, 27.13)	<0.0001	90.25 (14.09, 578.25)	<0.0001
S-KAP Practices scale	0.38 (0.01, 0.76)	0.045	0.20 (-0.32, 0.72)	0.434
Tobacco cessation, program services - Classes/counseling	2.63 (0.71, 9.83)	0.150	5.38 (0.45, 64.96)	0.185
Tobacco cessation, program services - Nicotine replacement therapy	4.01 (1.54, 10.43)	0.004	10.66 (2.20, 51.66)	0.003
Tobacco cessation, program services – Quitline referral	2.46 (0.93, 6.50)	0.070	4.79 (1.13, 20.37)	0.034

¹ Adjusted for age, gender, race/ethnicity, and education; and also controlled for nesting of staff within clinics
² Presented are odds ratios for dichotomous outcomes and mean difference for continuous outcomes
³ All staff (pre-intervention N = 135, post-intervention N = 144, both pre- and post-intervention N=61)
⁴ Current smoking staff (pre-intervention N = 24, post-intervention N =25)
⁵ Clinical staff (pre-intervention N= 74, post-intervention N =70, both pre- and post-intervention N=34)

3.5. Sensitivity analyses

3.5.1. Staff completing pre- and post- intervention surveys

Multivariate regression analyses shown in Table 4 (excluding current smoking and quit intention) were repeated for staff completing both pre- and post- intervention surveys. Findings were unchanged except for two outcomes. There was no pre- post difference in S-KAP Practices, unlike the significant difference found for the whole staff sample. There was a difference in pre- post staff reports of program-level quitline referral, changing from approaching significance (p = .070) to significant. Staff completing both pre and post surveys were significantly more likely to report that their program offered quitline referral post intervention than at baseline (AOR = 4.79, 95% CI 1.13, 20.37, p = .034).

3.5.2. Staff at programs implementing TFG

Multivariate regression analyses shown in Table 4 were repeated for workplace smoking policy, current smoking, and quit intention outcome variables using survey responses from the 5 programs that implemented TFG. Findings shown in Table 4 were unchanged in these sensitivity analyses.

4. Discussion

Tobacco-free policies, staff training in tobacco cessation, and the provision of tobacco cessation services are central components of clinical practice guidelines for addressing tobacco use in healthcare settings (Fiore et al., 2008). The TFR initiative was designed to assist California residential SUD programs implement these practices. By the end of the 18-month intervention period, 5 of 6 participating programs had adopted TFG. One program maintained a designated smoking area as required by the county in which it was located. According to directors surveyed post-intervention, all programs had conducted tobacco-related staff training, a finding corroborated by staff reports. Staff surveyed post-intervention were significantly more likely to report participation in training in the last 12 months than those surveyed at baseline. Yet, at 18-months, 40% of staff reported they hadn't received this training. This may, in part, reflect staff turnover and demonstrates the challenge of providing regular, tobacco-related staff training, and the need for sufficient in-program, training expertise and/or ongoing, online training access.

Directors reported increases in the number of programs offering some tobacco cessation services, including all 6 programs reporting provision of advice to quit, education classes, and referral to smoking cessation specialists at 18-months. At 18-months, staff were significantly more likely to report positive beliefs about addressing clients' tobacco use and higher levels of tobacco-related clinical practices, providing staff-level evidence of tobacco cessation services adoption. Among staff who completed both pre- and post-intervention surveys, tobacco-related practices did not increase significantly. This subsample did report increases in program-level provision of NRT and quitline referral, suggesting that, among longer-term staff, awareness of less intensive, tobacco-related program services increased while tobacco cessation counseling did not. Overall findings are similar to positive staff changes in tobacco-related attitude and practices associated with tobacco-free policy initiatives in behavioral health centers (Correa-Fernández et al., 2019) and residential SUD programs (Guydish, Ziedonis, et al., 2012), contributing to the evidence base for such interventions.

Director reports showed an increase from 2 to 3 programs offering NRT. Staff were significantly more likely to report program-level delivery of NRT at 18-months. These findings have concordance with clinical outcomes from the same policy intervention reported by clients showing pre- post-intervention increases in access to NRT and decreases in client smoking prevalence (McCuistian et al., 2021). However, directors' reports of only 3 programs offering NRT post-intervention are similar to low levels of NRT provision reported elsewhere (Eby, Laschober, & Muilenburg, 2015; Knudsen & Studts, 2011). They suggest that, despite TFG implementation, program-level barriers to providing NRT, such as available reimbursement, may have remained (Muilenburg, Laschober, & Eby, 2014). Low levels of NRT adoption are particularly common in publicly funded and smaller in SUD programs, suggesting lack of resources as a major barrier (Knudsen, 2017).

There was a non-significant increase in reports of quitline referral (25.7% to 45.7%) among the whole staff sample, and a significant increase from staff who completed surveys both pre- and post-intervention. The use of quitlines in SUD treatment as a low-cost treatment adjunct is an attractive option. However, given potential barriers to quitline access, study of their efficacy in SUD treatment is needed. We identified one pilot study which found that use of a tablet-based, quitline, motivational intervention increased readiness to quit smoking, but that only 19% of participants enrolled and received a quitline session (Brown et al., 2017).

TFG implementation has been associated with lower rates of client smoking and lower rates of staff smoking (Brown et al., 2012; Guydish, Tajima, et al., 2012; Guydish, Yip, et al., 2017). In the current study, staff were significantly more likely to report that no staff smoking was allowed at their organization post-intervention. However, in the 5 programs known to have established TFG by 18-months, 34.5% of staff reported that smoking was allowed, suggesting a lack of policy awareness, a lack of policy communication to staff, or indifferent enforcement. Additionally, there was no change in staff smoking rate or intention to quit among smoking staff, despite adoption of smoke-free workplaces in 5 of 6 programs. Staff smoking prevalence, at 17.4% pre-intervention and 17.8% post-intervention, remained higher than the general population, smoking rate of 11.2% in California in 2018 (CDC, 2018). Since staff wellness is important in its own right and since staff smoking has been associated with lower provision of tobacco cessation services (Guydish, Yip, et al., 2017; Laschober et al., 2015), direct measures to reduce tobacco use among staff, in addition to smoke free work places, should be considered.

4.1. Limitations

The use of a cross-sectional design precludes causal interpretation. Cross-sectional evaluations of tobacco-free policy interventions provide important information. However, randomized trials are feasible to conduct in community treatment settings and are necessary to strengthen

the evidence for both implementation and clinical outcomes for models such as the TFR (Flitter et al., 2019). Moreover, given that policy and practice changes in community treatment settings are challenging to sustain, lack of such information in the current study precludes reaching any conclusions regarding TFR intervention sustainment (Hailemariam et al., 2019). Additionally, although staff reports of their own training participation and provision of tobacco cessation services in the current study may be valid, their reports of program-level services and adoption of smoke-free workplace policies may reflect their level of policy awareness rather than actual implementation. The use of director reports of TFG and tobacco cessation program services mitigates this concern and is a strength of the current study. Although provider and administrator surveys are commonly employed to measure policy and practice adoption (Proctor et al., 2011), additional data sources for consideration in future studies could include direct observation (e.g., of TFG enforcement), observation of weekly treatment and staff schedules, and de-identified records documenting distribution of NRT and other tobacco cessation medications. Generalizability of results of the present study may be limited due to program selection procedures. The six programs in the TFR initiative were California, residential SUD treatment programs that applied and were selected for inclusion. These programs may be a select sample whose interest in addressing tobacco use among clients motivated their participation.

4.2. Conclusion

SUD treatment programs have been slow to implement evidence-based, practice guidelines for treating TUD, despite high rates of tobacco use and tobacco-related health consequences among individuals in treatment (Fiore et al., 2008; Marynak et al., 2018). Current findings suggest that the California TFR initiative was associated with implementation of tobacco-free grounds, increased tobacco-related, staff training, more positive beliefs about and increased provision of tobacco cessation services to clients. The TFR and similar policy interventions may be improved with greater emphasis on (a) regular staff training that facilitates policy awareness and teaches tobacco-related, treatment skills, (b) tobacco cessation services for smoking staff, and (c) resources that increase availability of NRT. The TFR model should be considered for further evaluation to examine implementation sustainment and clinical outcomes for tobacco using clients in SUD treatment.

Declaration of Competing Interest

The authors state that they have no conflicts of interest.

CRediT authorship contribution statement

Barbara K. Campbell: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Thao Le:** Methodology, Formal analysis, Data curation, Writing – review & editing. **Caravella McCuistian:** Conceptualization, Writing – review & editing. **Sindhushree Hosakote:** Investigation, Writing – review & editing. **Kwinoja Kapiteni:** Investigation, Writing – review & editing. **Joseph Guydish:** Writing – review & editing, Supervision, Project administration, Funding acquisition.

Role of funding sources

This work was supported by the California Tobacco Control Program (CTCP 18-10025) and a NIDA training grant (T32DA007250). The content is solely the responsibility of the authors and does not represent the official views of the State of California or the National Institutes of Health who had no role in data collection, analysis, or interpretation of the data, nor in development or submission of this manuscript

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