Original investigation

A Cluster-Randomized Clinical Trial Testing the Effectiveness of the Addressing Tobacco Through Organizational Change Model for Improving the Treatment of Tobacco Use in Community Mental Health Care: Preliminary Study Feasibility and Baseline Findings

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Abstract

Introduction: People with mental illness are more likely to smoke and less likely to receive tobacco treatment than the general population. The Addressing Tobacco Through Organizational Change (ATTOC) approach supports organizational change to increase tobacco treatment in this population. We describe preliminary study feasibility and baseline behaviors and attitudes among clients and staff regarding tobacco treatment, and assesse correlates of treatment of smoking.
Methods: Preliminary accrual, engagement, and baseline data are reported from a cluster-randomized trial comparing ATTOC to usual care. Feasibility, thus far, was the rate of site and participant accrual and engagement (eg, participants remaining in the trial). Correlates of assessing smoking, advising cessation, and providing treatment were assessed.
Results: Site and participant accrual is 80% (8/10) and 86% (456/533), and engagement is 100% and 82%. "Staff asking about smoking" was reported by 63% of clients and 38% of staff; "staff advising cessation" was reported by 57% of clients and 46% of staff; staff report "assisting clients with any medication" at most 22% of the time, whereas at most 18% of clients report receiving a cessation medication; 59% of clients want tobacco treatment, but 36% of staff think that it is part of their job. "Staff assisting with medications" is related to more training, believing treating smoking is part of their job, and believing patients are concerned about smoking ($ps < .05$).
Conclusions: This trial of training in tobacco treatment within mental health care is feasible thus far; self-reported rates of tobacco treatment are low and associated with clinician attitudes and barriers.

Implications: Evaluation of ways to help address tobacco use treatment in community mental health care is feasible and needed, including the use of technical assistance and training guided by an organizational change approach.

Introduction

Although US smoking rates declined from more than 50% in the 1960s to about 20% by 2000, the rate of smoking among persons with a serious mental illness (SMI) remains two to three times greater than that of the general population.[1,2] In fact, individuals with psychiatric disorders consume 44% of all the cigarettes in the United States, which translates into much greater morbidity and mortality for individuals with an SMI.[3–5] Compared with age-matched controls, individuals with an SMI are twice as likely to be diagnosed with cancer or cardiovascular and respiratory diseases, and smokers with an SMI show increased medical comorbidity, psychiatric symptoms, hospitalizations, and substance use than those with an SMI who do not smoke.[6–10] Individuals with SMI have been reported to have more than 25 years shorter life span than the general population.[11] Smoking also may interfere with psychiatric disorder treatment efficacy. Tobacco (not nicotine) induces the cytochrome P450 enzyme (CYP1A2) and speeds metabolism of many antipsychotics, antidepressants, and anxiolytics.[8] People with SMI who are smokers may require higher doses of medication than nonsmokers, increasing side effects and costs.[12]

Unfortunately, smokers with SMI are unlikely to receive evidence-based treatment for tobacco use disorder. In a national study of approximately 10 000 clinical encounters with a psychiatrist, only 12% of patients who smoke were offered tobacco use disorder treatment; other studies have found rates of tobacco use treatment to be as low as 9%.[13,14] In fact, psychiatrists are significantly less likely to treat tobacco use disorder than other physicians.[15,16] A recent study reported that outpatient psychiatrists provide cessation counseling for 23% of clinic visits with patients who smoke, but only provide nicotine replacement therapy for less than 1% of patients who smoke.[17]

Systemic and cultural factors endemic to many agencies that care for people with an SMI undermine effective tobacco use treatment.[18,19] For example, almost one-fourth of US psychiatric hospitals permit smoking on premises,[20] and smoking is often used as an incentive for prosocial behavior or treatment compliance.[21] In addition, in outpatient mental health settings, only half of facilities restrict outdoor smoking and only 1 in 10 ban smoking.[22] Many agencies underuse systemic resources for addressing tobacco use such as centralized methods to identify, track, and treat smokers. Their staff also often lack the expertise needed to provide effective care. Many agencies adopt a harm reduction perspective regarding smoking among people with an SMI; smoking is seen as less harmful than the assumed consequences of cessation: decompensation, depression, use of alcohol or illicit drugs, and removal of an effective coping strategy.[18,19,21] These barriers and beliefs decrease the likelihood that health care staff will treat tobacco use[14,23,24] and are contrary to existing evidence (eg, quitting smoking does not lead to decompensation[25–27] and is associated with improved psychiatric functioning[28]).

Adequately addressing the barriers and supporting sustained change in the clinical practice of providing tobacco use disorder treatment for people with an SMI requires innovations in clinical systems and culture[29,30] using an organization change approach as a

guide.[31] Indeed, recent reviews of organizational or systems change interventions for addressing tobacco indicate their effectiveness at improving clinical practice and highlight a number of strategies related to their benefits, such as implementing a system for assessing and recording smoking status, implementing dedicated staff to treat tobacco use and promote evidence-based treatment, and instructing organizations on how to receive reimbursement for these services.[32,33] The Addressing Tobacco Through Organizational Change (ATTOC) model is a systems-level intervention which provides expert technical assistance, training, and leadership support that addresses barriers and encourages ways to sustain change for better assessing and treating tobacco use disorders in mental health care settings.[31] It assumes that effective organizational change requires more than staff training; it also requires applying technical assistance and organizational theory to address attitudinal and system barriers and to promote a culture change in which tobacco use is treated and not just accepted as a given or even supported as a behavioral modification tool.[12] Addressing cultural barriers and strengthening the care system (eg, integrated treatment) increases the probability that interventions will be sustained past their initial implementation.

ATTOC has been implemented in more than 100 mental health and addiction settings, including Veterans Affairs community-based outpatient clinics, psychosocial rehabilitation clubhouse settings, and mental health centers in China. There have only been a few published evaluations of ATTOC (or similar organizational change approaches) but these have been conducted within inpatient substance abuse treatment programs and used a nonrandomized design.[29,30,34] The trial from which the present data are from comprises the first randomized clinical trial of ATTOC with a control group. This article reports on initial trial feasibility and baseline attitudes and behaviors among clients and staff regarding tobacco use treatment, and assesses baseline factors associated with clinician treatment of tobacco use. Consistent with this *Themed Section*, this article discusses initial trial feasibility, which includes a training program to increase psychosocial interventions for tobacco use at the organization and within the community, and targets a substantial population of smokers with SMI receiving treatment through community mental health care providers.

Methods

The overall study uses a cluster-randomized clinical trial design to evaluate ATTOC to address clinician treatment of tobacco use and client smoking. The protocol for this study is available at ClinicalTrials.gov ID NCT02849652. In partnership with Philadelphia's Community Behavioral Health, which manages the behavioral health care of its Medicaid-enrolled population, this 5-year trial has thus far randomized eight community mental health clinics (CMHCs) to either ATTOC or usual care (UC) for training clinicians to treat client tobacco use (see The Interventions section). A total of 14 CMHCs will be randomized and stratified by the size of the clinic and the degree to which the clinic leadership rates the organization as motivated to implement clinical changes based on the Organizational Readiness for Implementing Change measure.[35]

The trial's primary aims are to compare the effect of ATTOC with UC on rates of provider adherence to clinical practice guidelines for treating tobacco use, rates of client smoking, and client mental health functioning and quality of life. Following a baseline assessment, the ATTOC intervention is implemented for 36 weeks; outcomes are assessed at weeks 36 and 52.

For these analyses, data collected at baseline (see Measures section) were used to describe attitudes and behaviors among clients and staff regarding tobacco use treatment and to assess baseline factors associated with clinician treatment of tobacco use. Also, using accrual data and participant tracking data to assess engagement, we provide a preliminary assessment of the study feasibility.

Participants

Across the 14 sites, the target accrual is 280 staff and 700 clients. Sites are eligible if they have an electronic health record, provide access to prescription data, and can enroll at least 12 staff members. For staff, inclusion criteria are the following: be aged 18 years or older; have clinical, administrative, or supervisory duties; can communicate in English; and can provide informed consent. For clients, inclusion criteria are the following: be aged 18 years or older, report daily average of 5 cigarettes/day for the past 6 months, have a documented *Diagnostic and Statistical Manual of Mental Disorders* Axis I or II disorder, can communicate in English, and can provide informed consent. Clients who report exclusive use of electronic cigarettes are not eligible.

Procedures

University of Pennsylvania and the City of Philadelphia institutional review boards approved the study before enrollment began. Participants provide written informed consent. Site recruitment occurs using outreach to clinics through the Alliance of Community Service Providers and the Mental Health Partnerships. Direct outreach to clinic CEOs and directors has also occurred. Interested sites complete an eligibility assessment form, which collects information to assist with stratification. Eligible sites are randomized to ATTOC or UC.

Following randomization, research personnel attend clinics for 3–5 weeks to enroll staff and clients. Clients are approached in the waiting area to determine interest in enrolling; those interested are screened for eligibility and consented. Staff are recruited during meetings, and those interested are screened for eligibility and

consented. Enrolled clients and staff complete a baseline assessment (as described in the Measures section). Follow-up assessments to evaluate the primary aims are conducted at weeks 12, 24, 36, and 52.

The Interventions

ATTOC Intervention

The ATTOC intervention is implemented in three phases with 10 steps (Table 1) to guide sites and leadership through a cultural change and implementation of evidence-based practice. ATTOC is flexible to accommodate the unique needs, barriers, resources, and goals of an agency. Each organization begins at its own starting point regarding how they do or do not address tobacco in their tobacco treatment services, policies, training of staff, support for staff recovery, and leadership priorities. ATTOC starts with a baseline organizational readiness assessment and proceeds to intervention and evaluation, consistent with organizational change theory.[36] Across the steps within the phases, seven core strategies are used: (1) meetings, calls, and videoconferences to prepare for and implement the intervention; (2) on-site consultation and technical assistance, including the baseline and repeated environmental scan; (3) formation of the agency's tobacco champion and leadership to support culture and practice change, including the use of a "dashboard" assessment to provide performance feedback; (4) implementation of the agency's change plan to achieve client, staff, and agency goals; (5) formal training and technical assistance in treating tobacco use disorder at the agency with ongoing monitoring, feedback, and coaching by champions; (6) sustained consultations, including the use of the dashboard assessment to monitor organizational change and provide performance feedback; and (7) web-based support. ATTOC is implemented over 36 weeks via 10 sessions: 2 in-person (on-site) and 8 by video or teleconference (see: https://medschool.ucsd.edu/som/psychiatry/research/ATTOC/Pages/default.aspx).

Usual Care

Sites randomized to UC do not receive an organizational intervention to address tobacco use disorder treatment. However, to standardize training in tobacco cessation across UC sites, all sites are provided with a structured didactic training session (provided by RAS, FTL, ASF). The training, which occurs over 1–2 days, involves formal instruction and case study review. Topics covered include a program overview and rationale for treating nicotine dependence in the context of mental health care, a general introduction to nicotine

Table 1. The Addressing Tobacco Through Organizational Change (ATTOC) Model for Organizational Change to Treat Tobacco Use Disorder

Phase 1 (steps 1–5): prepare and organize

Step 1	Create a sense of urgency and assess engagement of top leaders of the organization and their goals
Step 2	Establish champions to lead and leadership groups to support the implementation
Step 3	Assess organization's readiness to change and how organization addresses tobacco, including chart/policy review (this step is repeated at other time points)
Step 4	Develop an initial written change plan and time line
Step 5	Develop a communication plan and materials needed for change

Phase 2 (steps 6–8): change, integrate, adapt

Step 6	Implement change plan for patient assessment, treatment plan, and treatment, including patient empowerment
Step 7	Implement staff training and recovery and monitor progress; encourage taking responsibility for addressing tobacco use
Step 8	Implement environment changes to support clinical treatment changes, including limiting or abolishing tobacco use

Phase 3 (steps 9–10): document, monitor, sustain

Step 9	Update policies and standard operating procedures
Step 10	Support sustained organization and cultural change (eg, addressing tobacco as part of job description)

See https://medschool.ucsd.edu/som/psychiatry/research/ATTOC/Pages/default.aspx for more details.

dependence, a review of guidelines for the treatment of nicotine dependence that includes methods to identify smokers, and the provision of behavioral interventions and guidelines for the medical management of tobacco use among those with an SMI. This standardized training was also provided to boost feasibility, because providing no training to control site personnel could have reduced site and personnel willingness to participate in this study.

Measures

Site Information

CEOs or clinic directors completed an assessment that collected information on the size of their clinic, their readiness to change,[35] the proportion of clients from racial minority groups, and the proportion of clients with psychotic disorders.

Demographic, Disease, and Employment Characteristics

Demographic information is collected from all clients and staff; (eg, age, race, diagnosis). From all clients, and from staff who smoke, we collect smoking history data (eg, age at initiation), including the Fagerström Test for Nicotine Dependence.[37] Employment characteristics of staff are collected, including type of position, years of experience, and number of hours per week worked.

Client and Staff Attitudes Toward Tobacco Cessation Treatment and Self-Reported Smoking Cessation Treatment Behaviors

The Smoking Knowledge, Attitudes, and Practices (S-KAP) instrument[38] is administered to staff. Items evaluate staff attitudes toward providing smoking cessation treatment to clients with SMI (eg, "Providing smoking cessation treatment is part of my job") and perceived barriers to providing smoking cessation treatment to clients with SMI (eg, lack of training). The Smoking Knowledge, Attitudes and Services (S-KAS) instrument[39] is administered to clients. The S-KAS items evaluate attitudes about smoking cessation such as (eg, "Quitting smoking can threaten my recovery"). Items on both scales are assessed using a Likert-type scale from 1 "strongly disagree" to 5 "strongly agree."

The S-KAP and the S-KAS also assess smoking cessation treatment behavior. Clients respond "yes" or "no" to questions about whether they are routinely asked about their smoking status, advised to quit smoking, provided with a referral for smoking cessation treatment, provided self-help smoking cessation material, provided smoking cessation treatment within their mental health care, and provided with nicotine replacement therapy, bupropion, or varenicline. Likewise, staff are asked how often they ask clients about smoking status and provide smoking cessation treatment, including nicotine replacement therapy, bupropion, or varenicline. A Likert-type scale is used with responses from 0 "never" to 4 "always."

Analyses

Feasibility was defined as how effectively sites were recruited into the trial (ie, the proportion of those invited that enrolled). All 10 of the approached sites completed the full screening process, so site accrual is based on approaching 10 sites. Feasibility was also measured by the rate at which clients and personnel are remaining in the study to this point in the trial. As the trial is still ongoing and sites are at different timepoints, this measure of engagement should be considered indicative of preliminary feasibility. Client and personnel accrual is based on the number of people approached for the study across seven of the eight sites as site 8 was scheduled for recruitment; engagement rates were also based on data from seven of the eight sites. Lastly, data from six of the eight sites were used to assess client and staff attitudes toward tobacco cessation treatment and self-reported smoking cessation treatment behaviors, which were characterized using proportions. Descriptive statistics were used to characterize the sample (eg, demographics). Bivariate analyses (Pearson correlation and analysis of variance) were conducted to evaluate factors associated with providing smoking cessation treatment: "asking about smoking status, advising clients who smoke to quit, and providing a medication to clients who smoke". Staff characteristics (Table 2) and attitudes and perceived barriers (Supplementary Figures 1–2) were examined as correlates of these three outcome measures. Factors associated with these outcomes (p < .10) were included in multiple linear regression models. Separate

Table 2. Characteristics of Sample

Clients (N = 280)		Staff (N = 118)	
Characteristics	% or Mean (SD)	Characteristics	% or Mean (SD)
Age, years	47.5 (11.2)	Age, years	42.4 (11.6)
Gender (% female)	40.4	Gender (% female)	77.1
Race (% minority)	71.1	Race (% minority)	63.5
Cigarettes/day	15.3 (11.0)	Smoking status (% smoking)	24.5
Carbon monoxide (ppm)	16.3 (11.0)	Quit interest (% want to quit)	82.7
FTND (% ≥ high)	44.5	Education (% ≤ high school)	4.2
Years smoked	29.5 (13.3)	Number of active clients	37.9 (46.5)
Education (% ≤ high school)	69.6	Years at agency	6.1 (6.0)
Income (% ≤$20 000)	88.6	Hours/week	37.9 (10.3)
Unemployment rate	87.9	Patient hours/week	23.5 (14.8)
Psychiatric diagnosis		Title	
Mood only	17.5	Medical[a]	10.2
Psychotic only	32.9	Counselor	56.8
Dual diagnosis	49.6	Administration	7.6
		Other	25.4

FTND = Fagerström Test for Nicotine Dependence. Data are from six sites; data from site 7 were not completely entered and those of site 8 were scheduled for August 2018.

[a]Medical refers to physicians and nurses.

models were examined for each outcome and predictors were evaluated using standardized beta weights, *t* tests, probabilities, and 95% confidence intervals.

Results

Accrual and Engagement

Site accrual has been 80% (8 of 10 approached enrolled); client accrual has been 82% (Client *N* = 324/394); and staff accrual has been 95% (Staff *N* = 132/139). Site engagement has been 100% (8/8); client engagement has been 82% (264/324); and staff engagement has been 83% (110/132). See Figure 1.

Sample Characteristics

Descriptive information for the sample is provided in Table 2; only data from 6/8 accrued sites are included (Client *N* = 280; Staff *N* = 118). Most clients are from racial minority groups and underresourced communities, as indicated by low education and income. Smoking rates and unemployment are high. Almost half of the client sample has two or more psychiatric diagnoses. Most staff are from racial minority groups, a quarter are smokers, and most want to quit smoking. More than three-quarters are social workers and have substantial caseloads.

Attitudes About Smoking and Smoking Cessation Treatment and Self-Reported Smoking Cessation Treatment Behaviors

Clients
Supplementary Figures 1 and 3 show the attitudes and tobacco treatment services reported by clients. A substantial proportion of clients are interested in smoking cessation treatment. For instance, 59% of clients want appointments for smoking cessation treatment; 51% indicated that smoking cessation treatment could help them quit; 47% indicate that the sites should provide smoking cessation treatment; and 70% acknowledge that smoking is a danger to their health. However, 30% of clients indicate that quitting smoking can threaten their recovery and 37% indicate that there is no benefit to quitting.

With regard to "asking clients about tobacco use," close to two-thirds of clients indicate that this is done routinely. Similarly, 57% of clients indicate that they are regularly "advised to quit smoking." In terms of "medication to assist with smoking cessation," 18% of clients indicate that a nicotine replacement was provided, 3% indicate that bupropion was provided, and 2% indicate that varenicline was provided; 22% of clients report having received a referral for smoking cessation treatment and 37% report having received self-help cessation material.

Staff
Supplementary Figures 1 and 3 show the attitudes and tobacco treatment services reported by staff. About half of the staff believed that the agency should provide smoking cessation treatment and 65% acknowledge that providing smoking cessation treatment could help patients quit smoking. However, only 36% of staff indicated that providing smoking cessation treatment is part of their jobs and only 35% indicated that patients want to quit smoking. More than half of staff indicated that a lack of training and a lack of client interest in smoking cessation treatment are barriers to providing care.
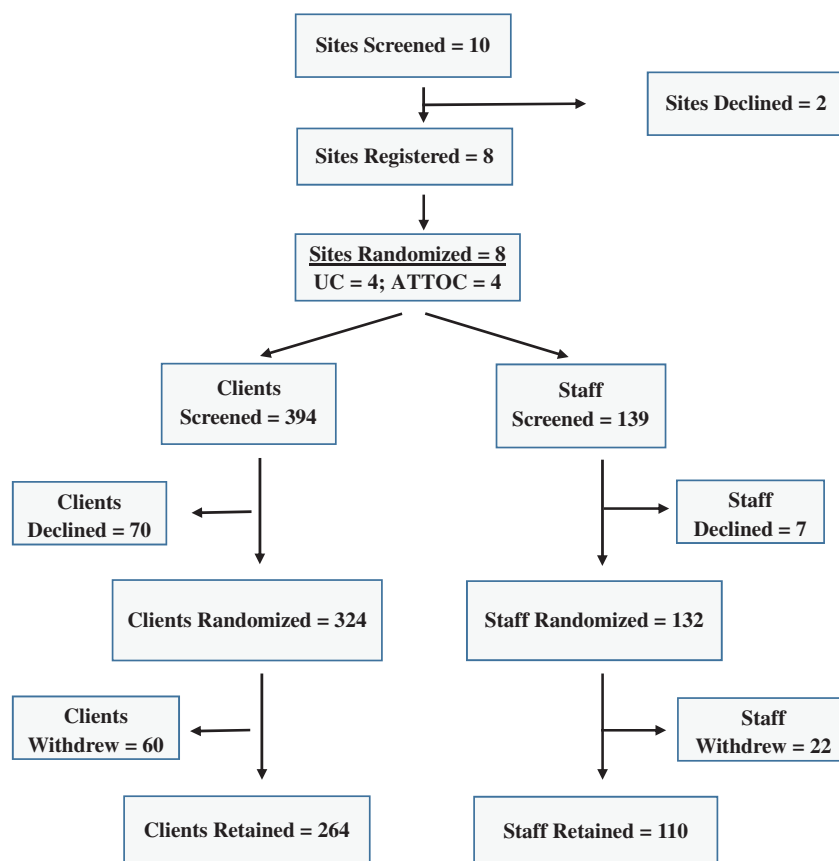

Figure 1. Site and participant accrual. Data presented do not include site 8, scheduled for baseline assessment August 2018.

Table 3. Correlations in the Relationship Between Staff Attitudes and Smoking Behaviors

Asking clients about tobacco use	r	p
Believing that quitting smoking would threaten client recovery	.19	.04
Believing that smoking cessation counseling is part of their job	.40	.001
Believing that the agency considers providing smoking cessation treatment to be important	.30	.01
Believing that providing smoking cessation counseling can help motivate clients to quit smoking	.18	.05
Believing that there is little benefit to quitting smoking	−.18	.10
Believing that clients are concerned about smoking	.22	.02
Advising clients to quit smoking	r	p
A lack of training in treating tobacco use	−.17	.07
Believing that the agency considers providing smoking cessation treatment to be important	.40	.01
Believing that providing smoking cessation counseling can help motivate clients to quit smoking	.29	.05
Believing that clients are concerned about smoking	.29	.002
Providing smoking cessation treatment will not affect smoking behavior	−.21	.02
Assisting clients with cessation using medications	r	p
A lack of training in treating tobacco use	−.32	.001
Believing that patients will not comply with treatment recommendations	−.16	.09
Believing that smoking cessation counseling is part of their job	.35	.001
Believing that the agency considers providing smoking cessation treatment to be important	.19	.05
Believing that providing smoking cessation counseling can help motivate clients to quit smoking	.19	.05
Believing that clients are concerned about smoking	.25	.002
Providing smoking cessation treatment will not affect smoking behavior	−.18	.06

With regard to "asking clients about tobacco use," 38% of staff indicate that this is done routinely (ie, always or very often or often). Similarly, 46% of staff indicate that they regularly "advise clients to quit smoking." From staff reports, in terms of "assisting clients with cessation using medications," 19% of personnel report routinely providing nicotine replacement therapy, whereas bupropion and varenicline are provide routinely by 8% and 5% of the staff, respectively. Referrals to a smoking cessation treatment program are reported by 40% of staff.

The Relationship Between Staff Attitudes and Smoking Behaviors

Univariate analyses indicated that "asking clients about tobacco use" was associated with job title [$F(3,113) = 5.01$, $p < .05$]. Specifically, medical staff were significantly more likely to ask clients about tobacco use than the other three groups, but the other three groups were not different from one another. "Asking clients about tobacco use" was positively associated with believing that quitting smoking would threaten client recovery, believing that smoking cessation counseling is part of their job, believing that the agency considers providing smoking cessation treatment to be important, believing that providing smoking cessation counseling can help motivate clients to quit smoking, and believing that clients are concerned about smoking (Table 3); believing that there is little benefit to quitting smoking was negatively associated with "asking clients about tobacco use" (Table 3).

The relationship between "advising clients to quit smoking" and job title approached significance [$F(3,112) = 3.83$, $p = .06$] and was negatively associated with a lack of training in treating tobacco use and the belief that providing smoking cessation treatment will not affect smoking behavior (Table 3). "Advising clients to quit smoking" was positively associated with believing that the agency considers providing smoking cessation treatment to be important, believing that providing smoking cessation counseling can help motivate clients to quit smoking, and believing that clients are concerned about smoking (Table 3).

"Assisting clients with cessation using medications" was associated with job title [$F(3,111) = 5.71$, $p = .001$]. Specifically, medical staff were significantly more likely to "assist clients with cessation

using medications" than the other three groups, but the other three groups were not different from one another. "Assisting clients with cessation using medications" was positively associated with believing that smoking cessation counseling is part of their job, believing that the agency considers providing smoking cessation treatment to be important, believing that providing smoking cessation counseling can help motivate clients to quit smoking, and believing that clients are concerned about smoking (Table 3). "Assisting clients with cessation using medications" was negatively associated with a lack of training in treating tobacco use, believing that patients will not comply with treatment recommendations and that providing smoking cessation treatment will not affect smoking behavior (Table 3).

Multivariate models indicated that higher levels of "asking clients about tobacco use" was associated with job title ($\beta = −.28$, 95% CI = −1.75% to −0.44%, $p = .001$), believing that quitting smoking would threaten recovery ($\beta = .26$, 95% CI = 0.10% to 0.47%, $p = .003$), and believing that smoking cessation counseling is part of their job ($\beta = .23$, 95% CI = 0.05% to 0.45%, $p = .015$). Likewise, higher levels of "advising clients to quit smoking" was associated with believing that smoking cessation counseling is part of their job ($\beta = .29$, 95% CI = 0.11% to 0.55%, $p = .003$), believing that patients are concerned about their smoking ($\beta = .23$, 95% CI = 0.05% to 0.47%, $p = .02$), and lower levels of believing that counseling patients to quit smoking will have little impact ($\beta = −.20$, 95% CI = −0.53% to −0.03%, $p = .03$). Finally, higher levels of "assisting clients with cessation using medications" was associated with job title ($\beta = −.26$, 95% CI = −2.93% to −0.57%, $p = .004$), lower levels of a lack of training ($\beta = −.24$, 95% CI = −1.37% to −0.21%, $p = .008$), believing that smoking cessation counseling is part of their job ($\beta = .21$, 95% CI = 0.05% to 0.77%, $p = .03$), and believing that patients are concerned about their smoking ($\beta = .22$, 95% CI = 0.07% to 0.80%, $p = .02$).

Discussion

This study investigates the preliminary feasibility of conducting a cluster-randomized clinical trial evaluating two forms of training in

tobacco cessation treatment within community mental health care, characterized client and staff attitudes toward smoking cessation treatment, and examined correlates of providing smoking cessation treatment. Thus far, trial feasibility is high, reported tobacco use treatment is very low, and many of the reported attitudes among staff about treating tobacco use support the need for an organizational intervention. Further, staff attitudes about smoking cessation treatment are predictive of the likelihood of them providing tobacco use treatment. These results are discussed more in the following paragraphs.

First, although conducting a cluster-randomized clinical trial within community mental health care can pose challenges (eg, recruiting a sufficient number of sites, keeping staff and clients in the study), this trial demonstrates high feasibility thus far, as measured by site, client, and personnel accrual and preliminary indicators of engagement. Preliminary trial success is in part attributable to engaging the City of Philadelphia's Community Behavioral Health and mental health advocacy organizations and incorporating their suggestions for study implementation. For instance, project leadership attend meetings with CMHC leaders and work to ensure that any unique barriers within a particular CMHC are understood and addressed. Participant recruitment, data collection, and interventions occur at the CMHCs, avoiding travel barriers and minimizing interruptions to workflow. These methods are consistent with descriptions of past successful community–academic partnerships to increase evidence-based treatment.[40]

Second, client and staff attitudes about smoking and smoking cessation treatment reveal important information for integrating smoking cessation treatment in CMHCs. Almost 60% of clients want smoking cessation treatment; more than half indicate that it could help them quit; and 70% acknowledge the dangers of smoking. Such data challenge the notion that smokers with SMI are disinterested in smoking cessation treatment.[41] Fortunately, in our sample, 65% of staff indicated that providing smoking cessation treatment can help clients quit, and 56% of staff indicated that the CMHC should provide such treatment. Taken together, these client and staff attitudes show greater receptivity to the integration of smoking cessation treatment within CMHCs in Philadelphia. Nevertheless, only about one-third of clients indicated that they want to quit smoking, and about one-third indicated that quitting smoking might threaten their recovery. Previous studies indicate higher rates of client quit motivation,[42] but several[43] report quit motivation among clients contacted about or enrolled in a smoking cessation treatment program, whereas we approached all patients who were smokers and clients were not required to commit to quitting smoking to enroll in the study. Thus, although motivation to quit among smokers with an SMI considering or enrolled in a cessation program may resemble the general population of smokers,[44] ambivalence and worry about cessation may be a more substantial problem among a broader group of smokers with an SMI.

Relatedly, staff cited a number of perceived barriers to providing smoking cessation treatment in the SMI context. Almost half of staff surveyed cited lack of training, poor client compliance, and a lack of client interest in smoking cessation treatment as barriers. Perceived lack of client interest was the most commonly cited barrier to treatment in previous studies,[41,21] and other studies have cited perceived lack of appropriate training to manage nicotine dependence effectively,[45,46] confirming that these attitudes are important potential targets for interventions designed to improve the clinical treatment of client tobacco use in the context of community mental health care.

Finally, our correlational analyses highlight several additional potential targets for an intervention to promote tobacco treatment among those with an SMI. If staff endorsed the concept that treating client tobacco use was part of their job, they were significantly more likely to ask about smoking, advise those who smoke to quit, and engage the client with smoking cessation medication options. Over the past decade, the culture within community mental health care concerning an agency's responsibility for managing a client's physical and mental well-being has changed,[47] moving beyond managing psychiatric symptoms to include issues such as diet, exercise, and stress management.[48,49] As such, boosting the staff's sense of responsibility over tobacco use (as is encouraged in the ATTOC approach) is becoming a more welcomed initiative, which may translate into improved clinical treatment for clients. As nonmedical staff (eg, social workers, case managers) were less likely to ask about smoking and engage clients with treatment options, efforts to ensure that a broader wellness perspective in CMHCs is adopted should target this subgroup of staff in particular.

Likewise, a greater recognition that clients are concerned about their smoking was associated with a higher likelihood of advising clients to quit smoking and engaging them in treatment, and a lack of perceived training was associated with lower rates of treatment engagement. Given that a lack of client concern[41] and a perceived lack of training[45] are frequent barriers cited by mental health care staff for not providing smoking cessation treatment, efforts to improve clinician behavior should target these attitudes.

Several study limitations should be mentioned. Most notably, as this is an ongoing trial, these findings should be viewed as preliminary. In particular, as more sites will be recruited into the overall trial and as some participants in this study had not reached the final assessment timepoint, our measure of engagement should be seen as preliminary. Further, the cross-sectional nature of the data prevent interpretations regarding causality. In addition, as we were required to ensure that eligible sites had an electronic health record so that elements of the ATTOC intervention could be implemented (eg, performance feedback), our results may only generalize to such organizations. Likewise, as participating sites had agreed to enroll in the study, their level of motivation to address tobacco use may limit the generalizability of the results; it should be noted that we collect baseline information on the site's readiness to address tobacco use and can examine this issue as a moderator. Lastly, the data are self-report, although the long-term outcome measures will include pharmacy data and biochemically confirmed abstinence.

Nevertheless, this study offers an important glimpse into our efforts to implement and evaluate an organizational intervention to promote the treatment of tobacco use in community mental health care and reduce smoking among those with an SMI. The present results show that a complex, cluster-randomized clinical trial of interventions to address clinical practice concerning tobacco use in community mental health care is, thus far, feasible; treatment of client tobacco use by staff is very low; many of the reported attitudes among staff about treating tobacco use support the need for an organizational intervention; and that addressing staff attitudes about smoking cessation treatment being part of their job and that clients are concerned about their smoking are important intervention targets. The continued evaluation of the ATTOC model for changing clinical practice and reducing client smoking will determine if it can serve more broadly as a model for the nation's community mental health care infrastructure, as it represents a potentially powerful initiative to address tobacco use in a highly underserved subgroup

of smokers. In addition, given that ATTOC is relatively time and resource intensive and costly, our future analyses will examine issues of treatment fidelity and cost-effectiveness in addition to the primary objectives of examining ATTOC's effects on clinician behavior and client smoking cessation outcomes.

Supplementary Material

Supplementary data are available at *Nicotine and Tobacco Research* online

Funding

Declaration of Interest

Schnoll receives medication and placebo free from Pfizer and has provided consultation to Pfizer. Schnoll has provided consultation to GlaxoSmithKline and consults with Palliatech. Beidas has provided consultation to Merck, consults with the Camden Coalition of Healthcare Providers, and has previously received royalties from Oxford University Press.

Acknowledgments

References

1. Ziedonis D, Hitsman B, Beckham JC, et al. Tobacco use and cessation in psychiatric disorders: National Institute of Mental Health report. *Nicotine Tob Res*. 2008;10(12):1691–1715.

2. Cook BL, Wayne GF, Kafali EN, Liu Z, Shu C, Flores M. Trends in smoking among adults with mental illness and association between mental health treatment and smoking cessation. *JAMA*. 2014;311(2):172–182.

3. Grant BF, Hasin DS, Chou SP, Stinson FS, Dawson DA. Nicotine dependence and psychiatric disorders in the United States: results from the National Epidemiologic Survey on alcohol and related conditions. *Arch Gen Psychiatry*. 2004;61(11):1107–1115.

4. Colton CW, Manderscheid RW. Congruencies in increased mortality rates, years of potential life lost, and causes of death among public mental health clients in eight states. *Prev Chronic Dis*. 2006;3(2):A42.

5. Miller BJ, Paschall CB III, Svendsen DP. Mortality and medical comorbidity among patients with serious mental illness. *Psychiatr Serv*. 2006;57(10):1482–1487.

6. Dalack GW, Healy DJ, Meador-Woodruff JH. Nicotine dependence in schizophrenia: clinical phenomena and laboratory findings. *Am J Psychiatry*. 1998;155(11):1490–1501.

7. Stroup TS, Gilmore JH, Jarskog LF. Management of medical illness in persons with schizophrenia. *Psychiatr Ann*. 2000;30(1):35–40.

8. Desai HD, Seabolt J, Jann MW. Smoking in patients receiving psychotropic medications: a pharmacokinetic perspective. *CNS Drugs*. 2001;15(6):469–494.

9. Goff DC, Henderson DC, Amico E. Cigarette smoking in schizophrenia: relationship to psychopathology and medication side effects. *Am J Psychiatry*. 1992;149(9):1189–1194.

10. Ziedonis DM, Kosten TR, Glazer WM, Frances RJ. Nicotine dependence and schizophrenia. *Hosp Community Psychiatry*. 1994;45(3):204–206.

11. Olfson M, Gerhard T, Huang C, Crystal S, Stroup TS. Premature mortality among adults with schizophrenia in the United States. *JAMA Psychiatry*. 2015;72(12):1172–1181.

12. Ziedonis D, Williams JM, Smelson D. Serious mental illness and tobacco addiction: a model program to address this common but neglected issue. *Am J Med Sci*. 2003;326(4):223–230.

13. Himelhoch S, Daumit G. To whom do psychiatrists offer smoking-cessation counseling? *Am J Psychiatry*. 2003;160(12):2228–2230.

14. Montoya ID, Herbeck DM, Svikis DS, Pincus HA. Identification and treatment of patients with nicotine problems in routine clinical psychiatry practice. *Am J Addict*. 2005;14(5):441–454.

15. Tong EK, Strouse R, Hall J, Kovac M, Schroeder SA. National survey of U.S. health professionals' smoking prevalence, cessation practices, and beliefs. *Nicotine Tob Res*. 2010;12(7):724–733.

16. Thorndike AN, Stafford RS, Rigotti NA. US physicians' treatment of smoking in outpatients with psychiatric diagnoses. *Nicotine Tob Res*. 2001;3(1):85–91.

17. Rogers E, Sherman S. Tobacco use screening and treatment by outpatient psychiatrists before and after release of the American Psychiatric Association treatment guidelines for nicotine dependence. *Am J Public Health*. 2014;104(1):90–95.

18. Morris CD, Waxmonsky JA, May MG, Giese AA. What do persons with mental illnesses need to quit smoking? Mental health consumer and provider perspectives. *Psychiatr Rehabil J*. 2009;32(4):276–284.

19. Prochaska JJ. Failure to treat tobacco use in mental health and addiction treatment settings: a form of harm reduction? *Drug Alcohol Depend*. 2010;110(3):177–182.

20. Schacht L, Ortiz G, Lane J. *Smoking Policies and Practices in State Psychiatric Facilities: Survey Results From 2011*. Falls Church, VA: National Association of State Mental Health Program Directors Research Institute, Inc. (NRI); 2012.

21. Himelhoch S, Riddle J, Goldman HH. Barriers to implementing evidence-based smoking cessation practices in nine community mental health sites. *Psychiatr Serv*. 2014;65(1):75–80.

22. Richter KP, Choi WS, Alford DP. Smoking policies in U.S. outpatient drug treatment facilities. *Nicotine Tob Res*. 2005;7(3):475–480.

23. Fiore MC, Jaen CR, Baker TB, et al. *Treating Tobacco Use and Dependence: 2008 Update*. Rockville, MD: U.S. Dept. of Health and Human Services, Public Health Service; 2008.

24. Johnson JL, Malchy LA, Ratner PA, et al. Community mental healthcare providers' attitudes and practices related to smoking cessation interventions for people living with severe mental illness. *Patient Educ Couns*. 2009;77(2):289–295.

25. Kahler CW, Brown RA, Ramsey SE, et al. Negative mood, depressive symptoms, and major depression after smoking cessation treatment in smokers with a history of major depressive disorder. *J Abnorm Psychol*. 2002;111(4):670–675.

26. Prochaska JJ, Hall SM, Tsoh JY, et al. Treating tobacco dependence in clinically depressed smokers: effect of smoking cessation on mental health functioning. *Am J Public Health*. 2008;98(3):446–448.

27. Evins AE, Cather C, Culhane MA, et al. A 12-week double-blind, placebo-controlled study of bupropion sr added to high-dose dual nicotine replacement therapy for smoking cessation or reduction in schizophrenia. *J Clin Psychopharmacol*. 2007;27(4):380–386.

28. Hitsman B, Moss TG, Montoya ID, George TP. Treatment of tobacco dependence in mental health and addictive disorders. *Can J Psychiatry*. 2009;54(6):368–378.

29. Williams JM, Zimmermann MH, Steinberg ML, et al. A comprehensive model for mental health tobacco recovery in New Jersey. *Adm Policy Ment Health*. 2011;38(5):368–383.

30. Bartlem K, Bowman J, Freund M, et al. Evaluating the effectiveness of a clinical practice change intervention in increasing clinician provision of preventive care in a network of community-based mental health services: a study protocol of a non-randomized, multiple baseline trial. *Implement Sci*. 2013;8(1):85.

31. Ziedonis DM, Zammarelli L, Seward G, et al. Addressing tobacco use through organizational change: a case study of an addiction treatment organization. *J Psychoactive Drugs*. 2007;39(4):451–459.

32. Thomas D, Abramson MJ, Bonevski B, George J. System change interventions for smoking cessation. *Cochrane Database of Syst Rev*. 2017;2(2): CD010742. doi:10.1002/14651858.cd010742.pub2

33. Skelton E, Tzelepis F, Shakeshaft A, Guillaumier A, Mccrabb S, Bonevski B. Integrating smoking cessation care in alcohol and other drug treatment settings using an organizational change intervention: a systematic review. *Addiction*. 2018. doi:10.1111/add.14369

34. Wang X, Peng Z, Ziedonis DM, Wang C, Yu B, Li T. Evaluation of tobacco use on Chinese population through ATTOC model: a cross-sectional survey on hospitalized psychiatric patients. *Int J Clin Exp Med*. 2015;8(4):6008–6015.

35. Shea CM, Jacobs SR, Esserman DA, Bruce K, Weiner BJ. Organizational readiness for implementing change: a psychometric assessment of a new measure. *Implement Sci*. 2014;9(1):7.

36. Cummings TG. Organizational development and change: foundations and application. In: Boonstra JJ, ed. *Dynamics of Organizational Change and Learning*. West Sussex, England: Wiley; 2004.

37. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. *Br J Addict*. 1991;86(9):1119–1127.

38. Delucchi KL, Tajima B, Guydish J. Development of the smoking knowledge, attitudes, and practices (S-KAP) instrument. *J Drug Issues*. 2009;39(2):347–364.

39. Guydish J, Tajima B, Chan M, Delucchi KL, Ziedonis D. Measuring smoking knowledge, attitudes and services (S-KAS) among clients in addiction treatment. *Drug Alcohol Depend*. 2011;114(2-3):237–241.

40. Pellecchia M, Mandell DS, Nuske HJ, et al. Community-academic partnerships in implementation research. *J Community Psychol*. 2018;46(7):941–952. doi:10.1002/jcop.21981

41. Brown CH, Medoff D, Dickerson FB, et al. Factors influencing implementation of smoking cessation treatment within community mental health centers. *J Dual Diagn*. 2015;11(2):145–150.

42. Peckham E, Bradshaw TJ, Brabyn S, Knowles S, Gilbody S. Exploring why people with SMI smoke and why they may want to quit: baseline data from the SCIMITAR RCT. *J Psychiatr Ment Health Nurs*. 2016;23(5):282–289.

43. Ashton M, Rigby A, Galletly C. What do 1000 smokers with mental illness say about their tobacco use? *Aust N Z J Psychiatry*. 2013;47(7):631–636.

44. Siru R, Hulse GK, Tait RJ. Assessing motivation to quit smoking in people with mental illness: a review. *Addiction*. 2009;104(5):719–733.

45. Gentry S, Craig J, Holland R, Notley C. Smoking cessation for substance misusers: a systematic review of qualitative studies on participant and provider beliefs and perceptions. *Drug Alcohol Depend*. 2017;180(1):178–192.

46. Trainor K, Leavey G. Barriers and facilitators to smoking cessation among people with severe mental illness: a critical appraisal of qualitative studies. *Nicotine Tob Res*. 2017;19(1):14–23.

47. Lawn S, Campion J. Achieving smoke-free mental health services: lessons from the past decade of implementation research. *Int J Environ Res Public Health*. 2013;10(9):4224–4244.

48. Williams JM, Ziedonis DM, Vreeland B, et al. A wellness approach to addressing tobacco in mental health settings: learning about healthy living. *Am J Psychiatr Rehabil*. 2009;12(4):352–369.

49. Piat M, Sabetti J, Bloom D. The transformation of mental health services to a recovery-orientated system of care: Canadian decision maker perspectives. *Int J Soc Psychiatry*. 2010;56(2):168–177.