


Evaluation of Community-Based Cessation Programs: How Do Smokers with Behavioral Health Conditions Fare?

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Received: 3 May 2016 / Accepted: 30 July 2017 / Published online: 2 August 2017

Abstract Though persons with behavioral health conditions experience large disparities in tobacco use, questions about the efficacy of evidence-based tobacco use treatment remain understudied in community health settings. This evaluation examined outcomes from eight community-based tobacco cessation programs for participants with and without behavioral health conditions (n=974 participants). The majority (64.8%) of participants reported one or more current behavioral health conditions, including mental illness and/or substance abuse. Participants who used cessation medication during the program and who attended more counseling sessions had an increased likelihood of being quit at 4-month follow-up. Quit rates were between 9.8% (intent-to-treat rate) and 30.6% (responder rate); behavioral health status did not negatively affect reported quit rates. Findings add to the growing literature evaluating community-based interventions within the behavioral health population.

Keywords Smoking · Smoking cessation · Mental health · Behavioral counseling · Tobacco use cessation products

Introduction

More than half of the roughly 42 million smokers in the United States have made a recent quit attempt, though only 6.2% stayed quit for at least six months (Centers for Disease Control and Prevention 2011; Jamal et al. 2014). Combined behavioral support and pharmacotherapy can significantly enhance cessation, with 6-month quit rates as high as 25% in some circumstances (Fiore et al. 2008; Stead and Lancaster 2012). U.S. Clinical and American Psychiatric Association Practice Guidelines recommend these treatment strategies for all tobacco users, including those with mental illness and/or substance use (hereafter referred to as behavioral health disorders). However, few of the studies on which these recommendations are based included tobacco use treatment interventions for smokers with behavioral health conditions (Fiore et al. 2008; American Psychiatric Association 2016). While evidence is growing on the efficacy of combined behavioral counseling and pharmacotherapy for this population (Banham and Gilbody 2010; Stapleton et al. 2008; Gilbody et al. 2015; Evins et al. 2014), many questions remain understudied, including the evaluation of tobacco use treatment programs in different settings such as community mental health centers and club house programs (Ziedonis et al. 2008; Aubin et al. 2012; Lee et al. 2011; Baker et al. 2016).

The smoking rate for persons without behavioral health conditions has significantly decreased over the past decade, but smoking among persons with behavioral health conditions has declined at a much slower rate (Cook et al. 2014). Persons with behavioral health conditions smoke at roughly twice the rate of those without behavioral health conditions (Lasser et al. 2000; Schroeder and Morris 2010). Smoking rates vary by specific diagnosis, with over 60% smoking rates for persons with schizophrenia (de Leon and Diaz

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2005) and up to roughly 90% for those in addiction treatment settings (Guydish et al. 2011).

Adults with behavioral health conditions also smoke at a greater intensity, consuming 44% of all cigarettes smoked by adults (Lasser et al. 2000) while comprising only 22% of the nation's population (Ziedonis et al. 2008). Persons with behavioral health conditions are more likely to be nicotine dependent and have lower quit rates than persons without behavioral health conditions (Centers for Disease Control and Prevention 2013; Lasser et al. 2000). However, a systematic review of literature measuring cessation motivation (e.g., stages of change, the contemplation ladder) found that smokers with behavioral health conditions have motivation to quit comparable to the general population; in the majority of included studies, smokers with behavioral health conditions were distributed similarly to the general population within the contemplation stage of smoking cessation (i.e., considering quitting in the next 6 months) and the preparation stage (i.e., planning to quit within the next 30 days) (Siru et al. 2009). The increasing disparity in tobacco use for those with behavioral health conditions suggests that tobacco control interventions have been less effective in this population (Cook et al. 2014). Even population-based strategies, such as mass media campaigns and increased tobacco excise taxes, may be less effective for persons with behavioral health conditions compared to the general population (Ashton et al. 2014; Paul et al. 2013).

Another reason that the behavioral health population experiences some of the largest disparities in tobacco use and tobacco-related health outcomes (Williams et al. 2013) is that tobacco use treatment for persons with behavioral health conditions has been largely ignored. Contributing factors to this problem include continued tolerance of the idea that smoking is normative self-medicating behavior, promotion of harm reduction principles (e.g., tobacco is less harmful and a lower treatment priority compared to illicit drug use), lack of provider training, the historical precedent of allowing or encouraging smoking in behavioral health facilities, and the misconception that cessation will aggravate mental illness symptoms (Hall 2007; Ziedonis et al. 2008; Aubin et al. 2012; Schroeder and Morris 2010; Prochaska 2010; Mackowick et al. 2012). Tobacco use is often not assessed by behavioral health specialists and is rarely included in treatment plans in inpatient settings (Schroeder and Morris 2010), though research indicates tobacco cessation and mental health and substance use treatment can occur concurrently without adverse effects and is even associated with reduced depression, anxiety, and stress (Ziedonis et al. 2008; Schroeder and Morris 2010; Evins et al. 2015; Prochaska et al. 2008; Banham and Gilbody 2010; Taylor 2014).

The relative lack of evaluation of tobacco treatment programs in community settings that serve behavioral

health populations limits development of a more robust evidence base. Recent studies report that quitline callers with behavioral health conditions are less likely to quit than callers without behavioral health conditions (Hebert et al. 2011; Kerkvliet et al. 2015; Lukowski et al. 2015; Vickerman et al. 2015). However, few quitline programs tailor services specifically for callers with behavioral health conditions (Rogers and Sherman 2010). In community mental health settings, tailored tobacco use treatment programs are feasible and well received (Lee et al. 2011), but the evaluation of outcomes from such community-based programs is limited (Ziedonis et al. 2008; Ashton et al. 2013). Examining outcomes from tobacco use cessation interventions in real-world settings for smokers with behavioral health conditions provides insight not captured by gold standard controlled trials, as trials often exclude persons with mental illness and/or substance use (Doolan and Froelicher 2006) and results do not necessarily translate seamlessly into community settings (Miller and Shinn 2005). To fill that gap, this study examines outcomes from a state-wide community-based tobacco cessation program among participants based on their behavioral health status. Specifically, we assessed how participants with and without behavioral health conditions compared in regard to program utilization (i.e., number of counseling sessions attended and NRT use) and program outcomes (i.e., 30-day quit at 4-month follow-up). As participants with behavioral health conditions received tailored counseling, we hypothesized similar outcomes would be seen among all participants regardless of behavioral health status.

Methods

Setting

Eight community-based tobacco cessation programs in local health and behavioral health clinics were implemented in 2013 as a component of Connecticut's Tobacco Use Prevention and Control Program. These programs were set in various community environments: three programs were located in health departments, two in behavioral health agencies, two in community health centers, and one in a hospital. Programs were contracted by the Connecticut Department of Public Health to target high-risk tobacco users, including those with mental illness and substance use. To recruit participants, staff primarily focused outreach and promotional efforts on providers within and outside their agency and trained providers on tobacco use assessment and referral.

Intervention

Participants who enrolled in the program received face-to-face counseling from a tobacco treatment specialist in individual and/or group settings, including an intensive one-on-one session at the time of enrollment. All counseling activities were based on the 2008 Clinical Practice Guideline for Treating Tobacco Use and Dependence (Fiore et al. 2008). Group sessions were informed by the American Lung Association's "Freedom from Smoking[®]" program (American Lung Association 2016) and when appropriate, tailored to participants with mental illness using the "Learning About Healthy Living" curriculum (Williams et al. 2012) developed specifically for that population. Program completion was defined as completing five individual counseling sessions or eight group sessions; participants were able to receive additional counseling sessions after official program completion as part of a lapse prevention. In addition to counseling, participants were eligible to receive twelve weeks of nicotine replacement therapy (NRT) or other cessation medication (i.e., bupropion or varenicline), as medically appropriate, free of charge.

Sample

Current smokers (defined as smoking cigarettes within the past 30 days) aged 18 and older who enrolled between 2013 and 2015 and attended at least one counseling session were considered for analysis (n=1086). Participants with complete baseline data were included in the final sample (n=974).

Measures

Baseline participant characteristics were self-reported at the time of enrollment, including current smoking status, health history, and previous quit attempts. Program participants were considered to have a current behavioral health condition if they reported currently receiving counseling, treatment, or medication for mental health, emotional, behavioral, or substance use problems (including depression, anxiety, schizophrenia, bipolar disorder, gambling, or alcohol or other drug abuse) at the time of enrollment. Outcomes at 4-month follow-up, such as changes in smoking behavior and use of pharmacotherapy while enrolled in the program, were also self-reported. Cessation was defined as 30-day point prevalence abstinence at 4-month follow-up. Due to low overall follow-up response rates (31.9%), both intent-to-treat quit rate analysis (i.e., a conservative analysis that assumes all non-responders continue to smoke), and responder quit rate analysis (i.e., an overestimate of the quit rate that excludes all non-responders from the denominator), were used to estimate program cessation rates.

Data Analysis

Chi square tests for categorical variables and Wilcoxon–Mann–Whitney tests for nonparametric continuous variables were used to identify differences in participant characteristics and program utilization among those with and without behavioral health conditions. A generalized linear model accounting for clustering of participants at different program sites was used to examine predictors of smoking cessation at 4-month follow-up, adjusting for participant and program utilization characteristics identified *a priori* based on prior literature and available baseline data (Caponnetto and Polosa 2008), including demographics, smoking intensity, previous quit attempts, cessation medication use, and behavioral health status. The intent-to-treat quit rate was the dependent variable in the model (i.e., non-responders were assumed to be continuing smokers). Data were analyzed in SAS Version 9.4 (SAS Institute, Inc., Cary, NC).

This study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill (Study #14–0651). The authors have no conflicts of interest. All authors certify their responsibility for this study and manuscript.

Results

Sample

Participants (n=974) were primarily white (78%), had lower educational attainment (63% with high school/GED degree or lower), and had government-sponsored insurance (73%) (Table 1). Roughly half of participants were heavy smokers (47% smoked at least 20 cigarettes per day at the time of enrollment), most (85%) had made a previous quit attempt, and 65% reported a current behavioral health condition, such as mental illness or substance use, with 18% reporting dual diagnosis (i.e., mental health and substance use disorder). Participants with a behavioral health condition were more likely to be younger, non-Hispanic, and have Medicaid insurance.

Program Utilization and Outcomes

Participants attended an average of nearly five counseling sessions; participants with a behavioral health condition were slightly more likely than participants without a behavioral health condition to complete the program—defined as completing five individual or eight group counseling sessions—though this difference was not significant (44.4% compared to 40.2%, respectively). Nearly half of

Table 1 Participant characteristics

	Total (n=974) [% (n)]	No behavioral health condition (n=343) [% (n)]	Behavioral health condition ^a (n=631) [% (n)]	p value ^b
Age				
Mean (SD)	46.0 (13.5)	49.2 (13.2)	44.3 (13.3)	<.0001
Gender				
Male	50.6% (493)	48.1% (165)	52.0% (328)	.25
Female	49.4% (481)	51.9% (178)	48.0% (303)	
Race				
White	77.6% (756)	74.9% (257)	79.1% (499)	.23
Black	10.7% (104)	12.8% (44)	9.5% (60)	
Other	11.7% (114)	12.2% (42)	11.4% (72)	
Ethnicity				
Non-Hispanic	79.3% (772)	74.3% (255)	81.9% (517)	.005
Hispanic	20.7% (202)	25.7% (88)	18.1% (114)	
Education				
<High school	23.9% (233)	26.5% (91)	22.5% (142)	.13
High school degree/GED	39.4% (384)	35.3% (121)	41.7% (263)	
Some college+	36.7% (357)	38.2% (131)	35.8% (226)	
Insurance				
Private	20.1% (196)	37.3% (128)	10.8% (68)	<.0001
Medicaid	58.6% (571)	37.6% (129)	70.1% (442)	
Medicare	14.0% (136)	12.8% (44)	14.6% (92)	
Uninsured	7.3% (71)	12.2% (42)	4.6% (29)	
Cigarettes per day				
0–10	37.0% (360)	39.1% (134)	35.8% (226)	.31
11–19	15.7% (153)	16.9% (58)	15.1% (95)	
20+	47.3% (461)	44.0% (151)	49.1% (310)	
Previous quit attempt				
Yes	85.1% (829)	86.9% (298)	84.2% (531)	.25
No	14.9% (145)	13.1% (45)	15.9% (100)	
Behavioral health condition				
Total	64.8% (631)	N/A	100% (631)	N/A
Anxiety	40.6% (395)		62.6% (395)	
Depression	39.0% (380)		60.2% (380)	
Substance use	29.7% (289)		54.2% (289)	
Bipolar disorder	11.8% (115)		18.2% (115)	
Schizophrenia	4.6% (45)		7.1% (45)	
Gambling	1.0% (10)		1.6% (10)	
2+ behavioral health conditions	39.0% (380)		60.2% (380)	
Mental health and substance use disorder dual diagnosis	18.2% (177)		28.1% (177)	

^aProgram participants were considered to have a current behavioral health condition if they reported currently receiving counseling, treatment, or medication for mental health, emotional, behavioral, or substance use problems (including depression, anxiety, schizophrenia, bipolar disorder, gambling, or alcohol or other drug abuse) at the time of enrollment

^bp value from Chi square test (categorical variables) and Wilcoxon–Mann–Whitney test (nonparametric continuous variables)

all participants (45%) used NRT or other cessation medication (i.e., bupropion or varenicline) during the program (Table 2); participants with behavioral health conditions were more likely than participants without behavioral health conditions to have used NRT or other cessation

medication (47.5% compared to 40.2%, respectively; $p=.03$).

Response rates at 4-month follow-up were 31.9%. Follow-up respondents were significantly more likely to be female; ages 35 years or older; have Medicare or private

Table 2 Program utilization and smoking status at 4-month follow-up, by behavioral health status

	Total (n=974) % (n)	No behavioral health condition (n=343) % (n)	Behavioral health condition (n=631) % (n)	p value ^a
Sessions attended				
Mean (SD)	4.7 (3.5)	4.3 (3.1)	4.8 (3.7)	.13
Program completion ^b				
Yes	42.6% (415)	39.4% (135)	44.4% (280)	.13
Used NRT or other cessation medication				
Any cessation medication	45.0% (438)	40.2% (138)	47.5% (300)	.03
NRT	41.9% (408)	38.5% (132)	43.7% (276)	.11
Varenicline	5.1% (50)	3.8% (13)	5.9% (37)	.16
Bupropion	2.0% (19)	1.8% (6)	2.1% (13)	.74
30-day quit rate				
Response rate	31.9% (311)	35.0% (120)	30.3% (191)	.13
Responder quit rate	30.6% (95)	29.2% (35)	31.4% (60)	.68
Intent-to-treat quit rate	9.8% (95)	10.2% (35)	9.5% (60)	.73

NRT nicotine replacement therapy

^ap value from Chi square test (categorical variables) and Wilcoxon–Mann–Whitney test (nonparametric continuous variables)

^bProgram completion is defined as completing five individual counseling sessions or eight group counseling sessions

insurance; have tried to quit tobacco previously; have used cessation medication during the program; and have completed the program. Response rates did not significantly differ by behavioral health status, though follow-up respondents were less likely to have a substance use and mental health disorder dual diagnosis. As intent-to-treat analysis was used in the generalized linear model, participants who did not respond to follow-up were assumed to still be using tobacco. Thus, results should be interpreted with caution, as certain groups had significantly lower response rates. Intent-to-treat quit rates were 9.8% and responder quit rates were 30.6%.

Accounting for clustering of participants at multiple program sites, a generalized linear model was used to examine the adjusted effects of participant demographics, smoking characteristics, behavioral health status, and program utilization on 30-day quit status at 4-month follow-up, using intent-to-treat analysis (Table 3). No demographic factors were associated with being quit. The likelihood of being quit increased for participants who had previously made a quit attempt (AOR = 2.09, 95% CI 1.13, 3.87; $p = .02$), who used NRT or other cessation medication during the program (AOR = 3.03, 95% CI 1.42, 6.45; $p = .004$), and who attended more counseling sessions (AOR = 1.15, 95% CI 1.08, 1.21; $p < .0001$). Heavier smokers (i.e., smoking at least 20 cigarettes per day at time of enrollment) had lower likelihood of being quit (AOR = 0.62, 95% CI 0.38, 0.99; $p = .05$). No significant differences were observed in the likelihood of being quit between those with and without a reported

behavioral health condition or between those with and without a mental health and substance use disorder dual diagnosis.

Discussion

This study provides evaluation of smoking cessation treatment in real world, community-based settings for smokers across a state, with and without behavioral health conditions. Our findings suggest that evidence-based tobacco use treatment for smokers with behavioral health conditions can be successfully implemented in a variety of community-based health and behavioral health settings. Participants with behavioral health conditions in these programs were successfully recruited and treated; roughly 65% of the participants enrolled in the programs reported a current behavioral health condition, and these participants achieved comparable program completion rates and cessation rates to participants without behavioral health conditions. These results add to the limited literature examining predictors of smoking cessation in community-based treatment programs. Importantly, findings show that the likelihood of cessation increased with attending more counseling sessions and using NRT or other cessation medication during the program, with no differences in quit rates between participants with and without behavioral health conditions or between participants with and without a mental health and substance use disorder dual diagnosis.

Table 3 Predictors of smoking abstinence (n=974)

	AOR (95% CI) ^a	p value
Age	1.02 (1.0, 1.05)	.06
Gender		
Male	Ref	–
Female	0.88 (0.54, 1.43)	.60
Race		
White	Ref	–
Black	1.08 (0.56, 2.07)	.83
Other	1.25 (0.39, 4.03)	.71
Ethnicity		
Non-Hispanic	0	–
Hispanic	0.97 (0.25, 3.69)	.96
Education		
Some college+	Ref	–
High school degree/GED	0.60 (0.31, 1.18)	.14
<High school	1.06 (0.53, 2.13)	.87
Insurance		
Private	Ref	–
Medicaid	1.31 (0.67, 2.56)	.43
Medicare	1.73 (0.72, 4.16)	.22
Uninsured	0.73 (0.44, 1.22)	.24
Cigarettes per day		
0–10	Ref	–
11–19	0.77 (0.30, 1.98)	.59
20+	0.62 (0.38, 0.99)	.05
Previous quit attempt		
No	Ref	–
Yes	2.09 (1.13, 3.87)	.02
Used NRT or other cessation medication		
No	Ref	–
Yes	3.03 (1.42, 6.45)	.004
Sessions attended	1.15 (1.08, 1.21)	<.0001
Behavioral health condition		
No	Ref	–
Yes	0.81 (0.47, 1.38)	.43
Mental health and substance use disorder dual diagnosis		
No	Ref	–
Yes	0.73 (0.39, 1.37)	.32

Self-reported 30-day point prevalence abstinence at 4-month follow-up using intent-to-treat analysis

AOR adjusted odds ratio, CI confidence interval

^aAdjusted odds ratio from a generalized linear model accounting for clustering of program participants at eight different program sites and adjusted for all listed variables

These findings support tobacco use treatment guidelines recommending combined counseling and pharmacotherapy for tobacco users with behavioral health conditions (Fiore et al. 2008). Results are also consistent with prior studies and contribute to growing evidence that treatment can be implemented successfully in settings such as community

mental health centers. For instance, another community-based smoking cessation program found that smokers with mental illness who received behavioral counseling and NRT achieved quit rates comparable to smokers without mental illness, with no negative impact on mental health symptoms (Currie et al. 2008). Further, relapse prevention conducted in community mental health centers using combined cognitive behavioral therapy and varenicline improved prolonged abstinence rates compared with cognitive behavioral therapy alone (Evins et al. 2014). Increasing efforts are being made to develop and evaluate cessation programs specifically for people with mental illness, such as the Smoking Cessation Intervention for Severe Mental Ill Health Trial, providing tailored behavioral support and pharmacotherapy delivered by mental health nurses (Gilbody et al. 2015).

Systems-level changes within health and behavioral health settings, such as integrating tobacco use assessment into providers' intake processes (McCullough et al. 2009), training providers on tobacco use treatment, and implementing smoke and tobacco-free policies on facility grounds, can help de-normalize smoking among persons with behavioral health conditions and staff members and encourage the use of evidence-based support. Perceived lack of patient interest in quitting and a high demand on clinician time and attention are cited as primary barriers to delivering tobacco use treatment in community behavioral health centers (Brown et al. 2015). However, a single motivational session can encourage tobacco users with behavioral health conditions to utilize cessation counseling and/or pharmacotherapy (Ferron et al. 2016), which in turn can lead to a higher likelihood of quitting. Increasing discussion between providers and patients with behavioral health conditions about evidence-based cessation treatment and improving accessibility to such treatment should be a priority.

Limitations

As this evaluation study was naturalistic and utilized data from community-based programs that were not designed or implemented as part of a formal research study, several limitations exist. To account for potential selection bias resulting from a low response rate at follow-up (31.9%), we used intent-to-treat analysis, assuming non-responders were continuing smokers. Future programs should consider offering a small incentive to participants or conduct shorter term follow up (e.g., 1 and 3 months post program enrollment) to facilitate higher follow-up response rates. The possibility of reverse causation must be considered in regard to program utilization (i.e., counseling sessions and pharmacotherapy) as a significant predictor of quit, such that participants who made positive changes to their smoking behavior early in

the program (e.g., tapering, abstaining) were more likely to stay engaged and use available NRT or other cessation medication and complete more sessions than participants experiencing an early set-back that may have led to drop-out. Finally, conclusions are limited by self-reported data. Smoking abstinence was not biologically verified, though self-reported smoking status can be valid and is often the only method many community-based programs can afford to collect data on program outcomes (Wong et al. 2012). Behavioral health conditions were defined broadly with no indication of condition severity, rather than by specific *DSM* diagnoses, limiting our ability to offer recommendations based upon specific clinical diagnoses in terms of most successful treatment protocol and barriers to quitting. For instance, participants with more severe diagnoses may have been more likely to discontinue the program or may have been less likely to quit, as has been observed in other studies (Cook et al. 2014). Despite these limitations, quit rates in this evaluation appear similar to published quit rates from other comparable community-based cessation programs for smokers with behavioral health conditions (Ashton et al. 2013; Currie et al. 2008).

Conclusions

This study addresses a significant challenge of enhancing the impact of smoking cessation interventions for those with behavioral health conditions, a largely underserved group. Findings add to the limited literature evaluating community-based interventions, particularly within the behavioral health population. Importantly, community programs in local health and behavioral health agencies were able to reach a high proportion of smokers with behavioral health conditions and these participants achieved comparable quit success to participants without behavioral health conditions. Health professionals should encourage tobacco users with behavioral health conditions to participate in community cessation programs and behavioral health agencies should consider integrating tobacco use treatment programs into their services.

Funding This work was supported by the Connecticut Department of Public Health Tobacco Cessation Program Evaluation contract. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views and policies of the Connecticut Department of Public Health.

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