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A Quasi-Experimental Study Examining New York State's Tobacco-Free Regulation: Effects on Clinical Practice Behaviors

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Abstract

Background—On July 24, 2008, New York State (NYS) became the first state to require all state-funded or state-certified substance use disorder (SUD) treatment organizations to be 100% tobacco-free and offer tobacco cessation (TC) treatment.

Methods—The current study used a quasi-experimental, non-equivalent control group design with a pretest and posttest to examine the effect of the NYS tobacco-free regulation on three clinical practice behaviors (use of TC-related intake procedures, use of guideline recommended counseling for TC, and pharmacotherapy availability) in a diverse sample of SUD treatment programs. Repeated cross-sectional data were collected from NYS counselors (experimental group) and non-NYS counselors (control group) approximately 4 months pre-regulation ($N = 282$ and 659, respectively) and 10–12 months post-regulation ($N = 364$ and 733, respectively).

Results—Using mixed-effects models, results at pre-regulation indicate no group differences in the three clinical practice behaviors. However, significant post-regulation effects were found such that the experimental group reports greater use of TC-related intake procedures, guideline recommended counseling, and availability of pharmacotherapy than the control group. Additionally, the experimental but not the control group shows increases in all three clinical practice behaviors from pre-regulation to post-regulation.

Conclusions—We conclude that the NYS tobacco-free regulation had a significant and positive effect on promoting patient TC efforts among counselors.

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Contributors

Lillian T. de Tormes Eby designed the study, collected the data (along with other research assistants), conducted part of the literature search, and drafted the final version of the manuscript.

Tanja C. Laschober analyzed the data, conducted part of the literature search, and wrote the first draft of the manuscript.

All authors have contributed to and approved the final manuscript.

Conflict of Interest

No conflict declared.

Keywords

implementation; tobacco cessation; longitudinal study; substance abuse treatment workforce; substance use disorder treatment; tobacco-free regulation

1. INTRODUCTION

Notwithstanding the high rate of smoking among individuals seeking substance use disorder (SUD) treatment (greater than 70%; Williams and Ziedonis, 2004) and the serious health consequences associated with tobacco use (Fiore et al., 2008; Prochaska et al., 2004; Satre et al., 2007), the integration of tobacco cessation (TC) treatment in SUD treatment has been painstakingly slow (Fuller et al., 2007; Richter et al., 2004). On one hand this is surprising, given national Public Health Service guidelines which urge health care professionals to address tobacco dependence (Fiore et al., 2008). On the other hand this is not surprising because until recently the SUD treatment field strongly discouraged health care professionals from providing TC treatment (McIlvain and Bobo, 2005). Reasons for this are the misconception that it will compromise the success of treating a patient's primary SUD (Weinberger et al., 2008), the mistaken belief that tobacco use is a lesser evil compared to other SUDs (Campbell et al., 1995; Prochaska et al., 2004), clinicians' own tobacco use, with estimates ranging from 20% (Knudsen et al., 2012) to 40% (Fuller et al., 2007), and the erroneous belief that patients are not interested in TC treatment (Campbell et al., 1995).

Despite these potential barriers to implementing TC efforts into SUD treatment, several states are taking steps to provide healthier environments for patients and staff by restricting tobacco use to designated outdoor areas or banning tobacco use both indoors and outdoors (National Association of State Alcohol and Drug Abuse Directors, 2010). New York State (NYS) has been a leader in such efforts, and in 2008 passed the most restrictive tobacco-free regulation of its kind. The objective of the current study is to evaluate the effects of the NYS tobacco ban in SUD treatment organizations through the use of a quasi-experimental non-equivalent control group design with a pretest and posttest. More specifically, we examine counselors' reports of clinical practice behaviors that support TC, both before and after the regulatory change, both in NYS (the experimental group) and in SUD treatment organizations outside NYS (the control group). We selected a repeated cross-sectional design for this study because our intent is to document what is happening in treatment programs at pre-regulation and post-regulation, based on the report of clinicians who are employed in these programs at a given point in time.

1.1. State-Wide Tobacco Policies in Substance Use Disorder Treatment Programs

The two states that have passed the most comprehensive and stringent state-wide tobacco policies in SUD treatment programs are New Jersey and New York. In 2001, as part of their licensure process the State of New Jersey regulated that all residential SUD treatment programs (1) be tobacco-free (indoors and outdoors), (2) assess patients for tobacco use, and (3) provide treatment for tobacco dependence (Foulds et al., 2006; Williams et al., 2005). They also provided free nicotine replacement therapy (NRT) to all residential treatment programs. Williams et al. (2005) found that residential programs adhered to the requirements to various degrees. Fifty percent of programs reported tobacco-free grounds and 85% of programs offered free NRT. Moreover, of the 77% of patients who were smokers at intake, 41% did not smoke while in treatment. As explained by Foulds et al. (2006), the varying degrees of implementation can be explained by the New Jersey's Division of Addiction Services decision to only monitor rather than enforce the regulation.

Thus, residential treatment programs had the option to adhere to the policy in full, in part, or ignore the requirements (Foulds et al., 2006; Williams et al., 2005).

In 2008, NYS passed a more comprehensive regulation by requiring all 1,419 state-funded or state-certified SUD treatment organizations overseen by the NYS Office of Alcoholism and Substance Abuse Services (OASAS) to be 100% tobacco-free (NY OASAS, n.d.). Extending the New Jersey initiative beyond residential programs, the OASAS tobacco-free regulation prohibits the use or possession of all tobacco products by patients, employees, volunteers, and visitors indoors and outdoors, as well as in vehicles that are owned, leased, or operated by the organization. Further, tobacco possession is prohibited, meaning that no tobacco products can be brought into the treatment center in pockets, purses, briefcases, etc. Finally, the regulation requires that treatment modalities be established for patients who use tobacco.

To date, four published studies focus on outcomes of the OASAS tobacco-free regulation. Using clinician and patient data from 10 NYS organizations around the time the OASAS regulation went into effect (June to August, 2008) and then again one year later showed a modest but statistically significant decline in patient smoking from 69.4% to 62.8% (Guydish et al., 2012). Guydish and colleagues (2012) also noted that clinician implementation practices, tobacco-related knowledge, and both clinician and patient attitudes toward the regulation varied by program type. For example, more patients in residential programs quit tobacco use following the OASAS regulation than patients in other program types.

Eby et al. (2012) used qualitative data from 261 counselors and 80 clinical supervisors working in 50 different NYS treatment programs. Both positive and negative outcomes of the OASAS regulation were noted by staff. Among the main positive outcomes were behavior changes (e.g., reduced tobacco use, increased intentions to quit smoking) and knowledge gains (e.g., greater awareness of the danger of tobacco use, knowing where to obtain assistance with TC). Challenges were also reported, with the main negative consequences being the reinforcement of patients' SUD-related behaviors like lying about tobacco and "dealing" cigarettes as well as enforcement problems. Another study by Eby et al. (in press) found that how the change is managed locally predicts clinicians' perceptions of the fairness of the regulation, which in turn predicts greater clinical practice behaviors to support TC as well as lower psychological and behavioral strain.

A final study by Brown and colleagues (2012) compared administrators' attitudes three years prior to the passage of the regulation and one year post-regulation. They found that over time, administrators reported less negative attitudes toward TC policies, fewer barriers to incorporating TC into treatment planning, and greater assessment and treatment services. They also found that patient resistance to the tobacco-free mandate decreased over time.

While these studies provide important insight into some of the successes and challenges associated with the OASAS tobacco-free regulation, no published research has utilized a non-equivalent control group design with pretest and posttest to compare counselors working in treatment programs affected by the tobacco-free regulation to a control group that did not experience a statewide tobacco ban. Although it does not include random assignment, this type of quasi-experimental design allows for reasonable causal inferences as to whether or not the OASAS regulation affected clinical practice behaviors to support TC in patients (Cook and Campbell, 1979). By collecting data at both pre- and post-regulation, in both NYS (experimental group) and non-NYS (control group) treatment programs, the present study will provide the most methodologically rigorous evaluation of the OASAS regulation to date.

1.2. Current Study and Hypotheses

We examine the effects of the OASAS tobacco-free regulation on three clinical practice behaviors as reported by counselors: (1) their use of TC-related intake procedures (e.g., ask patients about their tobacco use, advise them to quit), (2) their use of guideline recommended counseling (e.g., encourage patients to recognize triggers of tobacco use), and (3) the availability of pharmacotherapies to treat tobacco dependence in their treatment program (e.g., nicotine patch). Counselors are the front-line professionals who deliver services to patients. They also have considerable discretion in terms of whether or not to integrate TC into treatment as usual or recommend pharmacotherapies to patients, regardless of organizational policies (Knudsen et al., in press; Williams et al., 2005). The following hypotheses are proposed: 1) At pre-regulation, there will be no differences in use of TC-related intake procedures, guideline recommended counseling, and pharmacotherapy availability between counselors in the experimental group (NYS) and control group (non-NYS); 2) At post-regulation, counselors in the experimental group (NYS) will report greater use of TC-related intake procedures, guideline recommended counseling, and pharmacotherapy availability compared to counselors in the control group (non-NYS); 3) There will be increases in the use of TC-related intake procedures, guideline recommended counseling, and pharmacotherapy availability from pre-regulation to post-regulation, but only in the experimental group (NYS).

2. METHODS

2.1. Study Design

The data for this study were obtained from two longitudinal projects that employed similar study designs, albeit with different study aims. Data from the experimental group are from Managing Effective Relationships in Treatment Services (MERITS) II and data from the control group are from MERITS I. MERITS II and MERITS I were both funded by the National Institute on Drug Abuse (NIDA) in response to a program announcement for health services research on practice improvement using community treatment programs within NIDA's Clinical Trials Network (CTN). The MERITS II and MERITS I data used in the current study were collected at two points in time: (1) approximately four months before the OASAS tobacco-free regulation went into effect in July 2008 (pre-regulation) and (2) approximately 10-12 months after the OASAS regulation went into effect (post-regulation). All procedures were approved by the Institutional Review Board at the University of Georgia.

The main goal of MERITS II was to longitudinally track the effects of the OASAS tobacco-free regulation on counselors in NYS. At the time of data collection, the CTN had two New York "nodes" (NY City and Long Island), which are partnerships between a research center and a number of Clinical Trials Providers (CTPs). Seven of 10 eligible CTPs agreed to participate. We did not reach our sample size requirements with these 7 CTPs so we broadened recruitment to SUD treatment programs outside of the CTN. The final MERITS II sample included 14 organizations with 35 locations at pre-regulation and 16 organizations with 51 locations at post-regulation.

Because the MERITS II sample was not randomly drawn, we used the 2006 Substance Abuse and Mental Health Services Administration (SAMHSA) facility locator and National Survey of Substance Abuse Treatment Services (N-SSATS) database to identify whether our participating programs are similar to other NYS treatment programs. Aggregate characteristics of all NYS treatment programs were similar to our programs regarding a primary focus on SUDs and delivering detoxification services, hospital inpatient services, short-term residential services, long-term residential services, methadone maintenance,

services for adolescents, functioning as a halfway house, and treating criminal justice patients (a full report is available upon request from the first author).

The aim of MERITS I was to examine the predictors of turnover among counselors employed in diverse SUD treatment organizations across the U.S. The recruitment of treatment organizations occurred in May 2004 during formal presentations at the CTN's External Affairs Subcommittee Meeting and during the Community Treatment Program Caucus. Further, community treatment program directors who were well-known leaders within the CTN were introduced to the study and asked to facilitate recruitment of treatment organizations. MERITS I included 26 organizations with 115 locations at pre-regulation and 112 locations at post-regulation.

Participating treatment organizations for MERITS I were also not randomly sampled. Therefore, we compared our sample characteristics to similar research conducted using large nationally representative samples. This included Montoya's (2006) study using data from the National Survey of Substance Abuse Treatment Services (N-SSATS), Knudsen et al.'s (2010) research based on data from the National Treatment Center Study (NTCS), and Abraham et al.'s (2011) research which also used data from the NTCS. The MERITS I sample was highly similar with regard to hospital-based status, for-profit status, accreditation status, and the percentage of clinicians that are certified SUD professionals.

The same inclusion criteria were used for both MERITS II and MERITS I. All treatment organizations had to offer SUD counseling services and be located in the community (i.e., prison-based programs, driving-under-the-influence schools, Veteran's Health Administration programs were excluded) to be eligible for participation. At both time-points, trained research assistants traveled on-site to administer paper-and-pencil surveys to SUD counselors and administrators during regular business hours. Only counselors in direct contact with patients in a therapeutic relationship were eligible to participate (i.e., individual counseling, group counseling, or both). Shortly before our arrival, administrators provided a list of eligible counselors. Each counselor was assigned a unique identification number. Because of high counselor turnover rates (Eby et al., 2010), counselors not included on the original list, but who met the eligibility requirement and attended the data collection session were assigned a unique identification number on the spot and invited to complete a survey. This allowed us to keep track of counselors who participated at one or more time-points. Treatment organizations received \$1,000 compensation and \$50 per completed counselor survey to offset the staff time required to collect the data during normal business hours. The counselor response rate ranged from 67% to 74%.

2.2. Sample

2.2.1. Counselors—A total of 659 control group and 282 experimental group counselors completed surveys at pre-regulation and 733 control group and 364 experimental group counselors completed surveys at post-regulation. As shown in Table 1, the majority of counselors in both groups, at both time-points, were certified SUD professionals (52.28% to 61.90%), female (54.61% to 67.43%), and Caucasian (52.06% to 64.94%). Almost half of them held at least a master's degree (46.04% to 49.61%). Counselors ranged in age from 43.35 to 46.98 years, salaries ranged from \$33,620 to \$38,961, and the number of hours worked per week ranged from 37.35 to 42.32. Significant differences in counselor characteristics between the control and experimental group were found at both time-points (see Table 1). At pre-regulation, the experimental group had fewer females and Caucasian counselors, was older, earned more annually, and worked fewer hours per week than the control group. At post-regulation, more counselors in the experimental compared to the control group were certified SUD professionals, earned higher annual wages, and worked fewer hours per week.

2.2.2. SUD treatment organizations—According to reports from program administrators in the experimental and control groups collected pre-regulation and post-regulation (see Table 2), the majority of treatment organizations were not-for-profit entities (81.25% to 88.46%), free-standing units not located on a hospital campus (71.43% to 88.46%), and accredited (60% to 73.08%). Level of care varied, including inpatient only (15.39% to 43.75%), outpatient only (3.85% to 18.75%), and combined inpatient and outpatient (37.50% to 76.92%). According to administrator estimates, the percentage of patients who smoked ranged from 62.56% to 71.38%. The total average number of full-time counselors ranged from 33.14 to 54.88. Finally (not shown), organizations in the control group were located across the U.S. (with the exception of NYS) with 23.08% in the East, 11.54% in the Midwest, 26.92% in the South, and 38.46% in the West at both time-points; the experimental group was located in NYS. With the exception of geographical location, there were no significant differences in organizational characteristics between experimental and control groups at either pre-regulation or post-regulation.

2.3. Measures

2.3.1. Counselor measures—The same measures were used on the MERITS I and MERITS II surveys administered at pre-regulation and post-regulation. Counselors in the experimental and control group reported how often they personally use TC-related intake procedures (Knudsen and Studts, 2010; see Table 3 for individual items). Response options were: 1 = *never*, 2 = *not often*, 3 = *occasionally*, 4 = *most of the time*, 5 = *always*. At pre- and post-regulation, the scale was created by calculating the mean across the five items separately for the control group and the experimental group. Coefficient alpha was .85 for the control group and .86 for the experimental group at pre-regulation. Coefficient alpha was .86 for the control group and .84 for the experimental group at post-regulation. Counselors also reported how often they personally use guideline recommended counseling for treating tobacco dependence with patients who use tobacco at both time-points (based on Fiore et al., 2008; see Table 3 for individual items). Response options were: 1 = *never*, 2 = *not often*, 3 = *most of the time*, 4 = *most of the time*, 5 = *always*. The scale was created by calculating the mean across the eight items at pre-regulation and again at post-regulation, separately for the control and experimental group. Coefficient alpha was .94 for the control group and .95 for the experimental group at pre-regulation. Coefficient alpha was .94 for the control group and .91 for the experimental group at post-regulation. Finally, counselors reported whether or not medications are prescribed or dispensed at their treatment center to help patients achieve TC (0 = *no*, 1 = *yes*; Fiore et al., 2008; see Table 3 for individual items). The scale was created by summing responses to the seven items at both pre-regulation and post-regulation, separately for the control versus experimental group.

Counselors' also provided information on whether they are certified SUD professionals (0 = *no*, 1 = *yes*), on their gender (0 = *male*, 1 = *female*), level of education (coded as 0 = *less than master's degree*, 1 = *master's degree or higher*), race/ethnicity (coded as 0 = *racial/ethnic minority*, 1 = *Caucasian*), age in years, annual salary in dollars, and number of hours worked per week.

2.3.2. Program administrator measures—Data were also collected from program administrators in each of the experimental and control group treatment organizations. They provided data on their organizations' profit status (0 = *not-for-profit*, 1 = *for-profit*), hospital-based status [0 = *non-hospital-based* (free-standing unit not on a hospital campus), 1 = *hospital-based* (freestanding unit on a hospital campus/unit within a psychiatric hospital/unit within a general or other hospital)], accreditation (0 = *no*, 1 = *yes*), and level of care (1 = *outpatient only*, 2 = *inpatient only*, 3 = *combination of outpatient and inpatient*) at both

time-points. Additionally, program administrators provided information on the percentage of patients who smoke and the total number of full-time counselors.

Finally, to provide some context regarding the implementation of the OASAS tobacco-free regulation, program administrators in the experimental group provided information on the extent of their organization's implementation of the regulatory requirements at pre- and post-regulation. A checklist of 17 regulatory components (0 = *no*, 1 = *yes*) was developed based on the OASAS tobacco-free regulatory requirements outlined in Title 14 NYCRR Part 856 (NYS OASAS, n.d.) and a sum score was created for each organization to indicate implementation extensiveness. At pre-regulation, organizations implemented an average of 8.36 ($SD = 5.03$, Range = 0-17) of the 17 regulatory components. At post-regulation, organizations implemented an average of 12.56 ($SD = 3.10$, Range = 8-17) of the 17 regulatory components. The large standard deviations and wide range of values suggests substantial variability in the implementation of the regulation across the organizations, at both pre-regulation and post-regulation.

2.4. Data Analysis

Chi-square analyses and general linear models were conducted to check for significant differences in counselor-reported sociodemographic characteristics (see Table 1) and administrator-reported organizational characteristics (see Table 2) between the control and experimental group at each time-point. Counselor characteristics that significantly differed between the groups were correlated with the use of TC-related intake procedures, guideline recommended counseling, and tobacco pharmacotherapy availability. Gender and annual income were significantly positively associated with counselors' use of TC-related intake procedures and included as controls. Certification as a SUD professional, gender, and annual income were significantly positively related to counselors' use of guideline-recommended TC counseling and added as controls. Age and annual income were significantly positively correlated with counselor reported availability of pharmacotherapy and used as controls. As none of the organizational characteristics significantly differed between the groups, no organization-level control variables were necessary.

Hypotheses were tested with mixed-effects models due to the nested structure of the data, with counselors being nested within one of the multiple locations of the organization, and locations further being nested within an organization. With nested data, the assumption is that measurements on units within each level are more similar than measurements on units in different levels. This assumption was tested by calculating the intraclass correlation coefficients (ICCs), which showed that 21.7% of the variance for the use of TC-related intake procedures, 15.5% for guideline recommended counseling, and 31.9% for pharmacotherapy was explained by within location nesting, whereas 16.5% of the variance for the use of TC-related intake procedures, 10.1% for guideline recommended counseling, and 27.7% for pharmacotherapy was explained by within organization nesting. These ICCs suggest a fair to great amount of nesting within locations and organizations. Thus, we used mixed-effects models to account for the nested data to avoid misleading inferences. The mixed-effects models also accounted for the repeated cross-sectional design (i.e., the possibility that the same counselor participated at either both time-points, only at pre-regulation, or only at post-regulation).

Separate mixed-effects models were run for each of the three clinical practice behaviors: use of TC-related intake procedures, guideline recommended counseling, and pharmacotherapy availability. Each model included a variable representing time (pre-regulation or post-regulation), group membership (experimental or control group), the time x group interaction, and the counselor control variables previously discussed. Due to the unbalanced design,

least square means (lsmeans) were examined for significance using the pdiff option in SAS 9.3.

3. RESULTS

Hypothesis 1 proposed that at pre-regulation there would be no differences between the experimental and control group in the reported use of TC-related intake procedures, guideline recommended counseling, and availability of pharmacotherapy. The results are shown in Table 4 in the column labeled pre-regulation. As expected, no significant differences were found between the control and experimental group at pre-regulation.

It is also interesting to note the considerable variability in reported use of different aspects of TC-related intake procedures and guideline recommended counseling at pre-regulation. As shown in Table 3, counselors were most likely to report that they ask non-smokers if they have ever smoked and offer positive feedback as patients work toward TC goals. By contrast, counselors were least likely to give the number of a quitline to patients or develop a quitplan for patients.

Hypothesis 2 was supported, as indicated in Table 4, column labeled post-regulation. At post-regulation the experimental group reported significantly greater use of TC-related intake procedures, guideline recommended counseling, and availability of pharmacotherapy as compared to the control group. The experimental group had a least squares mean use of TC-related intake procedures of 3.89 compared to 3.19 of the control group, use of guideline recommended counseling of 3.64 compared to 2.97 of the control group, and availability of 2.76 TC medications in their organizations compared to .94 by the control group.

Consistent with our pre-regulation results, there was also considerable variation in the use of specific aspects of TC-related intake procedures and guideline recommended counseling in the experimental group at post-regulation, and the same pattern of effects in terms of the most frequently and least frequently endorsed items (see Table 3). In terms of the reported availability of pharmacotherapies, although counselors reported greater availability post-regulation, on average less than 3 of 7 tobacco medications are reported to be available (see Table 3).

Hypothesis 3 was also supported (see Table 4, column labeled pre- to post change). Within the experimental group, the least squares mean use of TC-related intake procedures significantly increased from 3.34 to 3.89 from pre-regulation to post-regulation. Both guideline recommended counseling (3.08 to 3.64) and pharmacotherapy availability also increased (1.34 to 2.76) from pre-regulation to post-regulation. In contrast, no significant pre-regulation to post-regulation differences were found in the control group.

4. DISCUSSION

The present study is the first to use a quasi-experimental, non-equivalent control group design with a pretest and posttest to investigate the effects of the OASAS tobacco-free regulation on counselor reports of clinical practice behaviors that support TC with patients. Two main conclusions can be reached from our findings. First, the OASAS tobacco-free regulation had a positive effect on three important clinical practice behaviors related to treating tobacco dependence: the use of TC-related intake procedures, the use of guideline recommended counseling, and reports of TC pharmacotherapy availability. Second, although the passage of the OASAS tobacco-free regulation is associated with increased use of TC clinical practice behaviors, there is much opportunity for improving the use of these practices.

4.1. Effects of the OASAS Tobacco-Free Regulation

At pre-regulation, counselors in the experimental and control group report similar TC clinical practice behaviors. Overall, both groups report “occasional” use of TC-related intake procedures and guideline recommended counseling. The average number of pharmacotherapies that counselors report are available at pre-regulation is around 1 out of 7. These pre-regulation findings demonstrate that when TC efforts are not mandatory, counselors are implementing them with considerable personal discretion and pharmacotherapy is not reported to be readily available. However, these pre-regulation findings are actually praiseworthy considering that tobacco dependence is frequently overlooked in the development of patient treatment plans, counselors often feel unprepared to treat tobacco dependence, and evidence-based TC treatments are generally slow to be adopted and implemented in SUD treatment (Fuller et al., 2007; Richter et al., 2004).

At post-regulation, when OASAS required SUD treatment programs to be tobacco-free, counselors in the experimental group demonstrate a significant increase in all three clinical practice behaviors. By contrast, no change is found among the control group. Because this is the first study to use a quasi-experimental, non-equivalent control group design, we can conclude that the results provide strong evidence that the OASAS tobacco-free regulation had a meaningful, positive impact on clinical practice behaviors specific to tobacco dependence, adding to the recent body of research examining various aspects of the OASAS tobacco-free regulation (Brown et al., 2012; Eby et al., in press; Guydish et al., 2012).

Unfortunately, despite the increase in clinical practice behaviors in the experimental group, we do not know why there is such variability in certain aspects of the clinical practice behaviors. One possible explanation is that some patients are resistant to help in general and specific aspects of the tobacco-free regulation in particular. In other situations counselors may be strapped for time or believe that the regulatory requirements interfere with drug treatment because counselors are put in the position of “policing” patients (Eby et al., in press; Kotz, 1993). Organizational factors might also play a role. Research demonstrates that not involving counselors in the implementation of organizational change, lack of local management support, and insufficient information about a pending change relates to employee resistance to change and can reduce the chance that employees will change their on-the-job behaviors (Eby et al., in press; Jimmieson et al., 2007; Rafferty and Griffin, 2006). A particularly important area for future research is identifying these barriers in order to make recommendations to reduce or eliminate them and boost clinical practice behaviors among counselors.

4.2. Limitations and Conclusions

We acknowledge some limitations of our study that should be taken into consideration when generalizing the results. First, we used counselor reports on their own TC implementation behaviors instead of direct observation by trained research assistants. As such, interpretation of results is limited to counselor accounts regarding clinical practice behaviors, which may differ from their actual behaviors. Future studies should draw on a variety of sources such as clinical supervisors, administrators, and direct observation in addition to counselors to ascertain differences in reports regarding the extent to which TC-related intake procedures and guideline recommended counseling are used and the availability of TC pharmacotherapy.

Second, our findings only shed light on a particular aspect of the OASAS tobacco-free regulation. For instance, the regulation states that SUD organizations have to be tobacco-free (indoors and outdoors), prohibit anyone from bringing tobacco-related products onto the grounds, and require that vehicles owned and operated by the organization be tobacco-free.

These aspects of the OASAS regulation were not examined here. We also did not examine how the regulation impacted patient or staff tobacco behavior, patient retention in treatment, or patient admission rates. These represent important areas for future study in order to more fully understand how the OASAS tobacco-free regulation affected multiple stakeholders in the SUD treatment system.

In conclusion, the current study is the first to use a quasi-experimental, non-equivalent control group design with a pretest and posttest to examine the effects of the NYS OASAS tobacco-free regulation. The use of a quasi-experimental design in the context of a naturally occurring regulatory change allows us to draw strong cause and effect conclusions about the effects of the OASAS regulation on counselors' reports of clinical practice behaviors related to treating tobacco dependence. Our findings build on previous non-experimental research on the OASAS regulation and provide strong evidence that the OASAS regulation positively affected NYS counselors' reported use of TC-related intake procedures, guideline recommended counseling, and availability of TC pharmacotherapy. With increasing numbers of states considering tobacco-free regulations in SUD treatment, the lessons learned from the NYS experience should prove valuable in efforts to effectively implement regulatory change in other SUD treatment programs.

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Table 1
Counselor-Reported Sociodemographic Characteristics at Pre-Regulation and Post-Regulation

	Pre-Regulation			Post-Regulation						
	Control	Experimental	χ^2/F	Control	Experimental	χ^2/F				
Certified SUD prof. (f, %)	340	53.13	149	55.60	.46	379	52.28	221	61.90	8.98**
Female (f, %)	439	67.43	154	54.61	13.97***	453	61.80	219	60.33	.22
Caucasian (f, %)	413	64.94	139	52.06	13.12***	453	62.48	204	58.12	1.89
Master's degree (f, %)	321	49.61	131	48.52	.09	337	46.04	175	49.16	.94
Age (M, SD)	43.35	12.56	46.98	12.18	15.85***	44.22	12.64	44.55	12.96	.17
Annual salary (M, SD)	34.164	9.592	38.961	12.587	36.38***	33.620	9.373	37.847	12.159	35.93***
Work hours/week (M, SD)	42.32	7.44	37.35	9.08	73.95***	41.32	7.98	38.22	8.26	73.95***

**
 $p < .01$

 $p < .001$.

Administrator-Reported Organizational Characteristics at Pre-Regulation and Post-Regulation of the Tobacco-Free Implementation

Table 2

	Pre-Regulation				Post-Regulation					
	Control	Experimental	χ^2/F		Control	Experimental	χ^2/F			
Not-for-profit (f, %)	23	88.46	12	85.71	.06	23	88.46	13	81.25	.42
Not hospital-based (f, %)	21	84.00	10	71.43	.87	23	88.46	12	75.00	1.29
Accredited (f, %)	18	72.00	9	64.29	.25	19	73.08	9	60.00	.75
Level of care (f, %)										6.55
Inpatient only	5	19.23	5	38.47		4	15.39	7	43.75	
Outpatient only	1	3.85	2	15.38		2	7.69	3	18.75	
In and outpatient mix	20	76.92	6	46.15		20	76.92	6	37.50	
% patients smoke (M, SD)	62.56	21.50	71.38	16.97	1.65	64.82	24.90	68.25	18.82	.21
# FT counselors (M, SD)	54.88	45.55	33.14	55.24	1.75	46.85	40.36	43.50	55.33	.82

Table 3

Counselors' Use of TC-Related Intake Procedures, Guideline Recommended Counseling, and Availability of Tobacco Cessation Pharmacotherapy

	Pre-Regulation		Post-Regulation	
	Control	Experimental	Control	Experimental
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Use of TC-Related Intake Procedures	3.20 (1.12)	3.22 (1.13)	3.17 (1.14)	3.89 (.96)
Ask new patients whether they are current tobacco users	3.82 (1.40)	3.87 (1.28)	3.80 (1.38)	4.37 (.99)
Ask non-smokers if they have ever smoked	3.10 (1.55)	3.05 (1.46)	3.01 (1.50)	3.82 (1.29)
Advise current tobacco users that they should quit	3.15 (1.38)	3.18 (1.37)	3.10 (1.37)	3.80 (1.29)
Assess current tobacco users for their willingness to quit	3.17 (1.39)	3.10 (1.40)	3.08 (1.41)	3.98 (1.20)
Use brief motivational interventions to increase willingness to quit	2.78 (1.35)	2.81 (1.40)	2.84 (1.36)	3.51 (1.29)
Use of Guideline Recommended Counseling with Tobacco Users	3.06 (1.18)	3.01 (1.19)	3.00 (1.19)	3.64 (1.00)
Develop "quit plan" for patients interested in quitting tobacco use	2.58 (1.43)	2.66 (1.43)	2.60 (1.43)	3.24 (1.44)
Provide self-help materials about smoking cessation	2.92 (1.44)	2.85 (1.44)	2.79 (1.42)	3.46 (1.39)
Give the number of a quit-line	2.55 (1.48)	2.52 (1.50)	2.59 (1.48)	3.12 (1.47)
Encourage patients to recognize "triggers" of tobacco use	3.04 (1.42)	2.90 (1.36)	3.00 (1.39)	3.64 (1.28)
Emphasize development of coping skills to deal with cravings	3.02 (1.40)	2.94 (1.36)	3.01 (1.40)	3.65 (1.20)
Focus on risks of continued tobacco use and rewards of quitting	3.18 (1.38)	3.15 (1.36)	3.11 (1.37)	3.76 (1.21)
Provide encouragement for patients' efforts to quit tobacco use	3.51 (1.34)	3.51 (1.31)	3.42 (1.33)	4.03 (1.05)
Offer positive feedback as patients work toward tobacco cessation goals	3.61 (1.34)	3.60 (1.30)	3.48 (1.37)	4.22 (1.01)
Availability of Tobacco Pharmacotherapy	.83 (1.57)	1.32 (1.76)	.88 (1.54)	2.67 (2.03)
Chantix	.16 (.36)	.25 (.43)	.17 (.37)	.40 (.49)
Bupropion	.11 (.31)	.18 (.39)	.18 (.39)	.38 (.47)
Nicotine gum	.16 (.37)	.21 (.41)	.15 (.35)	.59 (.49)
Nicotine patch	.25 (.43)	.40 (.49)	.25 (.43)	.67 (.47)
Nicotine inhaler	.05 (.21)	.10 (.30)	.03 (.18)	.20 (.40)
Nicotine nasal spray	.03 (.17)	.05 (.22)	.03 (.18)	.09 (.29)
Nicotine lozenge	.08 (.28)	.13 (.34)	.07 (.25)	.39 (.49)

Note. Scale anchors for TC-related intake procedures and guideline recommended counseling: 1 = never, 2 = not often, 3 = occasionally, 4 = most of the time, 5 = always. Scale anchors for pharmacotherapy availability: 0 = no, 1 = yes for each of 7 pharmacotherapies.

Table 4

Mixed-Effects Models Results for Time (Pre- and Post-Regulation), Group (Control and Experimental), and Time X Group Interaction

	Pre-Regulation			Post-Regulation			Pre- to Post Change		
	Control	Experimental	<i>t</i>	Control	Experimental	<i>t</i>	Control	Experimental	<i>t</i>
	<i>M^I</i> (SE)	<i>M^I</i> (SE)		<i>M^I</i> (SE)	<i>M^I</i> (SE)		<i>t</i>	<i>t</i>	
TC-related intake ²	3.19 (.09)	3.34 (.13)	-.96	3.19 (.09)	3.89 (.12)	-4.68***	-.11	-5.77***	
Guideline counseling ³	3.00 (.08)	3.08 (.12)	-.57	2.97 (.08)	3.64 (.11)	-5.07***	.35	-5.45***	
Pharmacotherapy ⁴	.87 (.16)	1.34 (.23)	-1.70	.94 (.16)	2.76 (.22)	-6.77***	-.80	-10.09***	

Note. Scale anchors for TC-related intake procedures and guideline recommended counseling: 1 = never, 2 = not often, 3 = occasionally, 4 = most of the time, 5 = always. Scale anchors for pharmacotherapy availability: 0 = no, 1 = yes for each of 7 pharmacotherapies.

^ILeast Squares Means

²Controlling for counselor gender and annual income

³Controlling for counselor certification as SUD professional and gender

⁴Controlling for counselor age and annual income.

p < .001.