

A Mixed-Methods Assessment of a Brief Smoking Cessation Intervention Implemented in Ohio Public Health Clinics, 2013

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Abstract

Objectives In 2006, the state of Ohio initiated the implementation of a brief smoking cessation intervention (5As: *Ask, Advise, Assess, Assist, and Arrange*) in select public health clinics that serve low-income pregnant and post-partum women. Funds later became available to expand the program statewide by 2015. However, close to half of the clinics initially trained stopped implementation of the 5As. To help guide the proposed statewide expansion plan for implementation of the 5As, this study assessed barriers and facilitators related to 5As implementation among clinics that had ever received training.

Methods A mixed-methods approach was used, comprising semi-structured interviews with clinic program directors (n = 21) and a survey of clinic staff members (n = 120), to assess implementation-related barriers, facilitators, training needs, and staff confidence in delivering the 5As.

Results Semi-structured interviews of program directors elucidated implementation barriers including time constraints, low self-efficacy in engaging resistant clients, and paperwork-related documentation challenges. Facilitators included availability of community referral resources, and integration of cessation interventions into the clinic workflow. Program directors believed they would benefit from more hands-on training in delivering the 5As. The survey results showed that a majority of staff felt confident

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advising (61 %) or referring clients for tobacco dependence treatment (74 %), but fewer felt confident about discussing treatment options with clients (29 %) or providing support to clients who had relapsed (30 %).

Conclusions Time constraints and documentation issues were major barriers to implementing the 5As. Simplified documentation processes and training enhancements, coupled with systems change, may enhance delivery of evidence-based smoking cessation interventions.

Keywords Smoking · Cessation counselling · WIC · Pregnancy

Significance

Previous studies assessing implementation of smoking cessation interventions have focused largely on clinical settings, such as doctors' or dentists' offices. In contrast, our study examines smoking cessation interventions in Ohio public health programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Although WIC programs do not provide direct prenatal care services, they serve a large proportion of low-income women and thus provide opportunities to increase perinatal smoking cessation. Using a combination of qualitative interviews and survey data, we examine barriers, facilitators, and potential improvement areas in delivering smoking cessation interventions in Ohio public health clinics.

Introduction

Several adverse reproductive effects have been attributed to maternal smoking, including preterm delivery, restricted fetal growth, and sudden infant death syndrome [1–3]. Ohio has one of the worst infant mortality rates in the US (7.9 deaths per 1000 live births), higher than the US national average (6.1 deaths per 1000 live births) [4, 5]. Similarly, the proportion of women Ohio who smoke in the 3 months before pregnancy (31.1 %) and continue to smoke throughout pregnancy (16.5 %) is high [6]. Consistent with the disproportionately higher smoking rates among lower socio-economic groups in the US population [7], lower income women are at much higher risk for continuing to smoke throughout pregnancy. In Ohio, women covered by Medicaid have fivefold higher smoking prevalence during the last 3 months of pregnancy compared with women not covered by Medicaid (32.2 vs. 5.8 %) [8]. Similarly, women participating in the Special Supplemental Nutrition Program for Women, Infants, and

Children (WIC) had almost threefold higher smoking prevalence during the last 3 months of pregnancy compared to women not participating in WIC (29.2 vs. 10.1 %) [8].

Health professionals play an important role in educating their patients about the health risks of smoking and in providing effective cessation interventions [9]. Most smokers want to quit, especially pregnant women concerned about the health of their babies [10]. The US Public Health Service Clinical Practice Guideline for treating tobacco use and dependence recommends that healthcare providers employ the 5As to help smokers quit: (1) *Ask* all patients whether they use tobacco; (2) *Advise* all smokers to quit; (3) *Assess* smokers' willingness to quit; (4) *Assist* smokers with quitting; and (5) *Arrange* follow-up contact to prevent relapse [9].

To address perinatal smoking among low-income women, the Ohio Department of Health (ODH) established the Ohio Partnership for Smoke-Free Families (OPSFF) in 2006 [11]. OPSFF provided trainings on the 5As to public-health funded clinics that serve low-income women. This included 22 WIC projects (the approximately 200 WIC clinics across the 88 counties in the state of Ohio are organized into 84 WIC "Projects") [12]. Furthermore, all 13 Child and Family Health Services (CFHS) direct perinatal care clinics in Ohio were also trained [13]. An important element of the training was the use of the Five A's Intervention Record, or "FAIR Form", to document each client's exposure to the five steps of the intervention [14]. Clinics were expected to maintain the FAIR form in each client chart, and chart reviews were performed by OPSFF staff as part of regular site visits to assess each clinic's utilization of the 5As. ODH program evaluations conducted in 2010 demonstrated that about half of WIC Projects that had received training had discontinued 5As implementation and documentation.

In 2013, ODH received \$1 million in funding from the state's general fund for immediate use to reduce perinatal smoking. Funds were earmarked to expand the quality and reach of the 5As to at least 50 % of WIC projects and 100 % of CFHS clinics by 2015. Additionally, ODH planned to incorporate the 5As into other state-funded programs that provide services to pregnant and post-partum women, including 50 % of family planning programs; 100 % of Ohio Infant Mortality Reduction Initiative (OIMRI) programs (a small home visiting initiative for African American women modeled on healthy start); and 10 % of Help Me Grow (HMG) programs (a larger home visiting initiative). To facilitate the efficient use of these limited funds, this rapid public health evaluation assessed barriers and facilitators to implementing the 5As in state-funded public health clinic settings.

Methods

Study Participants

This study was conducted in September 2013; all 13 CFHS clinics, as well as the 22 WIC projects that had received training in the 5As, were eligible for inclusion for the public health evaluation. A mixed-methods approach was used, and included a semi-structured interview of directors of WIC Projects and CFHS clinics, and a survey of all staff members in eligible projects and clinics. CDC determined that this project was IRB exempt.

Data Collection

Semi-structured interview guides were developed to assess barriers and facilitators of implementation of the 5As (online supplements S1–S3), and were pilot tested with ODH staff. Two trained research teams (each team comprising an interviewer and a note-taker) conducted interviews with directors of WIC Projects and CFHS clinics in-person or by telephone with the intent of continuing interviews until reaching saturation (the point at which no new information was being obtained). The median interview duration was 30 min and all interviews were audio-recorded.

An online survey was developed by adapting validated questions derived from surveys of health professionals' knowledge, attitudes, beliefs, and behaviors regarding smoking cessation assistance and counseling (online supplement S4). A link to the online survey was sent to the directors of participating WIC Projects and CFHS clinics, who were asked to forward it to all of their staff for completion. A reminder was sent if no response was received after 5 days, and the survey was closed 3 weeks after it was distributed. Questionnaires were completed by a total of 120 staff members from participating WIC Projects ($n = 79$ staff members from 18 WIC Projects; project participation rate = 81.8 %) and CFHS clinics ($n = 41$ staff members from 10 CFHS clinics; clinic participation rate = 76.9 %).

In the survey, receipt of training in implementing the 5As was defined as a "Yes" response to the question, "Have you received formal training on how to help pregnant or postpartum women stop smoking?" Survey participants were also asked how often they implemented the various components of the 5As to clients; response options of "Sometimes," "Usually," or "Always" (versus "Never" or "Rarely") were treated as a positive indication that the activity was implemented by staff members.

The survey also collected information on staff's tobacco use, confidence in engaging patients in different steps of the 5As, barriers or challenges to providing

smoking cessation counseling; resources available to staff to assist smoking clients; resources that staff would like to use to learn more about smoking cessation for their clients; and topic areas that staff would like to know more about.

Data Analyses

After concluding an interview, audio data were transcribed and used to expand handwritten notes. The expanded notes were reviewed in detail and codes were generated to summarize the data. The research team then convened, reconciled coding discrepancies, and combined similar or overlapping codes into overarching themes, which were then reviewed and refined through consensus. The overarching themes were assessed as facilitators or barriers using a multi-leveled theoretical framework in three nested socio-ecologic levels of analysis: intra-personal, institutional, or community level factors [15]. Intra-personal factors were defined as issues within the control of, or affecting staff members or clients primarily at an individual level. Institutional or clinic-level factors were identified as issues affecting WIC projects or CFHS clinics as a unit. Community-level factors were themes or ideas that participants observed in their community as a whole, such as social norms and community resources, which had an impact on smoking behavior and quitting. We combined interview responses obtained from the different types of clinics assessed because we found consistent barriers and facilitators across board; e.g., the challenges reported by WIC projects that chose not to implement the 5As were similar to those expressed by those still implementing the 5As.

Data from the online survey were summarized using descriptive statistics and analyzed using Excel and SAS version 9.3 (SAS Institute Inc., NC).

Results

Characteristics of Study Participants

The qualitative interviews were deemed to have reached saturation after interviews were completed with 21 program directors (9 CFHS, 12 WIC). All directors were females and their median number of years working at the clinic was 15 years (range 0.75–38.0). Differences between WIC and CFHS settings and 5As delivery are highlighted in Table 1.

A total of 120 staff members completed the electronic survey; nearly all (99 %) respondents were female and 72 % were aged ≥ 40 years. The distribution of survey respondents by their clinical duties is shown in Table 2.

Table 1 Differences between WIC and CFHS clinics in their structure, training, and use of the 5As, Ohio, 2013

Parameter	WIC	CFHS
Provision of direct healthcare services (e.g., perinatal care)	No (supplemental nutrition program only)	Yes
Populations served	Pregnant women (throughout pregnancy and up to 6 weeks after birth or pregnancy ends); breastfeeding women (up to infant’s first birthday); non-breastfeeding, postpartum women (up to 6 months after birth or after pregnancy ends); infants (up to first birthday); and Children (up to their fifth birthday)	Women of child-bearing age, infants, children, adolescents and families, especially those at-risk for poor health and/or those who are uninsured or under-insured
Coverage	Nationwide program. In the state of Ohio, there are approximately 200 WIC clinics organized into 84 “projects”	Ohio program. There are 13 CFHS clinics in the state of Ohio
Year 5As introduced	Piloted in 2006 (expanded in subsequent years up to the study period)	2012
Unit of 5As training and evaluation	“Project”-level	Clinic-level
Extent of 5As training at time of study	25 % of WIC projects (22 of 84 projects)	100 % (all 13 CFHS clinics)
Active sites at time of study	54.5 % (12 of 22 trained)	100 % (all 13 trained)
5As implementation policy	Voluntary	Contractually required
5As documentation procedure	FAIR form	Free text field on electronic Records known as Integrated Perinatal Health Information System (IPHIS)
Smoking status documentation procedure	Captured in electronic system on health assessment form	Varies; can be included in IPHIS record but not required

Table 2 Role in clinic by site type (WIC versus CFHS) among respondents of staff survey, Ohio, 2013

Role in clinic	Total (%) N = 117	WIC (%) N = 76	CFHS (%) N = 41	p value
Dietetic (RD, Dietetic tech, other nutrition)	38 (32 %)	37 (32 %)	1 (1 %)	<0.001
Medical (RN, Medical assistant, other medical)	39 (33 %)	14 (12 %)	25 (21 %)	<0.001
Social work	8 (7 %)	1 (1 %)	7 (6 %)	0.005
Administrative (Administrator, office staff)	23 (20 %)	17 (15 %)	6 (5 %)	0.320
Breastfeeding peer counselor	7 (6 %)	6 (5 %)	1 (1 %)	0.450
Interpreter	2 (2 %)	1 (1 %)	1 (1 %)	>0.990

Analyses excluded three respondents with missing information regarding their clinical duties

5As Delivery in Ohio Public Health Clinics

Beginning with the pilot in 2006, ODH provided support for implementation of the 5A’s in WIC projects and CFHS perinatal care clinics. This included an initial visit to each site to assess patient flow and develop a systems-based approach to implementation of the program. In a typical clinic, new clients attending the clinic were asked about their smoking status during check-in; those who smoked were advised of the harmful consequences of smoking and assessed of their interest in quitting during clinic consultations. Clients interested in quitting were assisted by provision of cessation aids, such as stop-

smoking pamphlets/booklets, and motivational stickers, as well as referrals to addiction specialists, quit lines or websites. The staff members delivering the 5As interventions in WIC projects and CFHS clinics varied widely, and included dietitians, lactation specialists, nurses, and social workers. During follow-up visits, clients who had indicated in earlier visits that they smoked were asked if they still smoked and if they were interested in quitting. Documentation of interventions delivered was made using the FAIR form.

Results from online survey of clinic staff showed that the majority (84.8 %) of respondents were involved in providing services to help clients to quit smoking. The

proportion of respondents who reported providing each step of the 5As to clients was as follows: “Ask” (91.0 %); “Advise” (82.0 %); “Assess” willingness to quit (65.0 %); “Assist” using self-help smoking materials (71.0 %); monitor client progress in attempting to quit (49.0 %); or provide support to clients who had relapsed (30.0 %).

Barriers to Implementing the 5As

Individual-Level Barriers

Staff survey data revealed that nearly half (47 %) of respondents reported facing barriers to providing smoking cessation counseling. Lack of patient interest (59 %), having never received training on implementing the 5As (47.8 %), not having enough experience in counseling smokers (41.5 %), inability to prescribe smoking cessation medications (32.1 %), or the perception that smoking cessation interventions were ineffective (5.7 %) were reported to be barriers to implementing the 5As. As shown in Table 3, most staff members wanted to learn more about several aspects of smoking cessation counseling such as motivating clients to quit and the use of pharmacotherapy for tobacco dependence treatment.

Semi-structured interviews of program directors revealed similar barriers, including issues of limited hands-on training and low self-efficacy in implementing all components of the 5As (Table 4).

I think we could have done more role-playing
I don't like all the steps. I like the 3[i.e., Ask, Advice, and Assist] better... [the 5As] breaks it down too much... and it makes it harder

Other individual-level barriers identified by program directors included poor coping skills, addiction, poor social support, and stress on the part of the clients:

They'd say 'I know I shouldn't smoke...but I'm so stressed.'...they're just using it as a coping mechanism.

...it's hard to give up that hand-mouth thing.

Family members also smoke so [our pregnant clients] don't have that support [to quit].

Clinic-Level Barriers

Staff survey data identified several systemic challenges to implementing the 5As at the clinic-level. Some of these included not having enough time to spend with clients (50.9 %), lack of educational materials for staff (24.5 %), lack of reimbursement to care providers for smoking cessation counseling (11.3 %), no existing mandate, policy, or requirement to provide smoking cessation services (7.5 %), and lack of staff support (7.5 %).

Semi-structured interviews of program directors reiterated some of these challenges and provided further insights into other clinic-level barriers. A major barrier highlighted by WIC clinic project directors was documentation

Table 3 Areas of interest for future smoking cessation counseling training as identified during survey of WIC and CFHS clinic staff, by step of the 5As, Ohio, 2013

5As step	Area of interest	Percent
Ask	How to ask clients about smoking so you get an honest response	36.3
	How to advise a client to stop smoking	32.7
Advise	The negative effects of smoking on a pregnant woman, the developing fetus, other children, and other household members	27.4
	Working with pregnant smokers under the age of 18 years	23.9
	Understanding other social and medical problems that sometimes occur in smokers (other drug and alcohol use, mental health issues, etc.)	19.5
	Understanding tobacco use as an addiction	17.7
	Skill-building for how to talk to pregnant clients about quitting smoking (i.e., motivational interviewing techniques)	40.7
Assess	What to do if a client continues to smoke	36.3
	The role of medications in treating tobacco addiction during pregnancy and the postpartum period	40.7
Assist	What self-help materials to give a smoker	34.5
	How to help the smoker get support from her home or workplace	33.6
	How to provide social support as part of cessation treatment for a woman who smokes	29.2
	Motivating clients who continue to smoke to quit	46.9
	How to organize the clinic in terms of record keeping and client flow so that the smoking status of a client is assessed at follow-up visits	3.5

Respondents could choose multiple options, so percentages do not sum to 100 %

Table 4 Multi-level facilitators and barriers to implementation of the 5As as reported by directors of WIC and CFHS clinics, Ohio, 2013

Socioecological levels	Implementation category	Theme
Intra-personal (individual-level)	Barrier	Limited training or low self-efficacy among staff in smoking cessation counseling
	Barrier	Client tobacco addiction
	Barrier	Poor social support for clients
	Barrier	Client stress
	Facilitator	Staff confidence in engaging clients in smoking cessation
	Facilitator	Client risk perception
Institutional (clinic-level)	Barrier	Reported ambiguous advice from physicians about quitting
	Barrier	Time constraints
	Barrier	Absence of performance metrics
	Barrier	Documentation challenges
	Facilitator	Access to clinical smoking cessation resources
	Facilitator	Integration of 5As into clinic routine
	Facilitator	Innovations in
Community-level	Context dependent ^a	Social norms
	Context dependent ^a	Community resources

CFHS Child and Family Health Services, WIC Special Supplemental Nutrition Program for Women, Infants, and Children

^a Themes were described as context-dependent if their perceived impact on the delivery of smoking cessation interventions was dependent on the extent of access e.g., community resources, (present or absent), or societal perception, e.g., social norms, (positive or negative)

challenges. In WIC clinics, two separate documentations were required for each client; one entry specifically for the 5As on the FAIR form, and a different entry in the WIC electronic records system [17]. One director said:

...wish it [5As documentation] could somehow be incorporated into the [existing] WIC paperwork....they [staff] sometimes feel they're writing the same thing twice

Other clinic-level barriers identified from semi-structured interviews with program directors included time constraint; reported ambiguous advice from physicians about quitting, and concerns among clinic staff about whether the 5As they were implementing were really effective—arising from their inability to objectively measure or quantify the impact of their delivery of the 5As.

Just about the only challenge [to implementing the 5As] would be finding the time to get that [5As] put in. We address so many things, especially [during] that first appointment- between breastfeeding, and nutrition, and registering to vote; going through the foods list; explaining the whole program- it can get to be quite... tedious.

Some of the physicians don't really press them to quit, they just encourage that they decrease the amount. [Having] data would be the ultimate reason as to why staff would continue. If I could prove to them that

we're actually making a difference, then they would feel more value for the program.

Community-Level Barriers

According to the staff survey, close to half of respondents (43 %) indicated that lack of community resources for referral was a barrier to implementing the 5As.

This perception was also reflected in semi-structured interviews with program directors.

Why do all this counseling and then you have no one [for them] to follow up with? It's like a dead end.

Right now, all we have is the Quit Line and that doesn't work for everyone.

We don't have any local quit groups either. We do use the Quit Line but we don't have any other local type of resources.

Facilitators to Implementing 5As

Individual-Level Facilitators

High levels of confidence among staff in engaging patients in smoking cessation facilitated delivery of the 5As. The staff survey revealed that the majority of respondents felt highly confident in advising clients to quit (64.0 %), arranging referrals (74.0 %) and assessing clients'

Table 5 Self-reported confidence of WIC and CFHS clinic staff in their ability to perform different components of the 5A's intervention Ohio, 2013

Please rate your confidence in doing the following to help your clients quit smoking	Low confidence (%)	Some confidence (%)	High confidence (%)
Advise client to quit smoking	3	33	64
Assess client willingness to quit	11	38	51
Discuss treatment options with clients	33	38	29
Motivate clients to consider quitting	14	50	36
Refer to others or quit line for appropriate treatment	5	21	74
Monitor client progress in attempting to quit	11	40	49
Provide support to clients who have relapsed	24	46	30

willingness to quit (51.0 %); a smaller percentage however felt confident in motivating clients to consider quitting (36.0 %); or discussing treatment options with clients (29.0 %) (Table 5).

Semi-structured interviews of program directors also highlighted the importance of staff's confidence in engaging patients, as well as familiarity with the structured approach of the 5As.

I think it helps us focus on what questions to ask, and the process.

Clinic-Level Facilitators

Staff's perception that helping smokers to quit was a healthcare priority facilitated delivery of the 5As. Median scores on a 10-point Likert scale (ranging from 1 = strongly disagree to 10 = strongly agree) as assessed from the staff survey showed strong institutional support for smoking cessation interventions as shown in the following measures: "Learning how to counsel my patients to quit smoking is not a priority for me because I must focus on other health issues with my patients" (median score = 2), "I do not counsel my patients to quit smoking because other providers outside of my clinic provide these resources" (median score = 2), "Brief counseling is effective in helping pregnant women quit smoking" (median score = 5.0), "Postpartum smokers are receptive to smoking cessation interventions" (median score = 5), "Pregnant smokers are receptive to smoking cessation interventions" (median score = 7).

Semi-structured interviews of program directors indicated that implementation of the 5As was easier in clinics that had integrated smoking cessation interventions into their day-to-day clinical routine:

Since we do it [5As] all the time, I don't really think much about it.

Access to smoking cessation resources, as well as development of innovative strategies to enhance smoking cessation

counseling (e.g., incorporation of text messages or use of other media in providing motivational counseling to clients), were perceived as facilitating clinics' delivery of 5As.

Having the materials to provide to the clients so it's not like 'Well, this is what we recommend, but you're on your own!'

If they (clients) have texting capabilities, we provide them with a sticker....that has the name of the program [5As]-it's similar to 'Text4baby' [a service that provides pregnant women and mothers of infants, including WIC clients, with free text messages on a variety of health topics] [16].

People learn in different ways... I don't know if it [might] be beneficial ...to even have them [clients] watch a video, that's like a motivational-type video.

Community-Level Facilitators

According to the staff survey, 57.0 % of respondents reported they frequently referred clients to a smoking cessation specialist or quit line.

Semi-structured interviews indicated that most program directors agreed that the presence of community resources, such as telephone quit lines or cessation specialists, was very helpful because the resources ensured a continuum of care beyond the clinic for smoking clients trying to quit.

We tell them the dangers and risks [of smoking during pregnancy] and then definitely refer them to the other programs [referring to a tobacco grant-funded cessation specialist at the local health department].

Discussion

This study identified several challenges and opportunities in implementing the 5As in Ohio public health clinics for pregnant smokers, some of which included lack of self-

efficacy and paperwork-related documentation challenges—issues which have also been raised in previous research in other perinatal settings [17, 18]. Addressing the challenges identified in this study is important because they may prevent or limit the delivery of smoking cessation interventions, or attenuate the effect of such interventions [18]. The US Public Health Service's Clinical Practice Guideline on Treating Tobacco Use and Dependence recommend that pregnant smokers should be offered person-to-person psychosocial interventions that exceed minimal advice to quit [9]. Ohio public health clinics provide avenues to instill health-promoting behavior among populations at high-risk for smoking attributable disease and death. During 2013, approximately 61,581 women visited Ohio WIC clinics and approximately 7000 were served by CFHS clinics [19], highlighting several opportunities to deliver smoking cessation counseling to pregnant and post-partum smokers in Ohio public health clinics, which currently are largely being missed.

Although barriers to implementation of the 5A's were identified on all three levels of the social-ecological model that we analyzed, clinic level factors will likely be more readily addressed through the state-wide expansion to improve adherence and enhance implementation of the intervention. Addressing some of these clinic-level barriers may require systems changes to ensure that smoking cessation is better integrated into routine public prenatal care in order to facilitate delivery of the intervention, and increase the likelihood of quitting smoking early during pregnancy [20]. For example, time constraints could be addressed by auditing clinic practices to ensure more efficient use of time—including consultation and waiting time—to engage clients in smoking cessation interventions. Similarly, documentation challenges may require simplifying and integrating data collection systems such that they are easier to complete and eliminate redundancy.

Some of the proposed changes for the statewide expansion include additional training and more resources for existing clinics. Clinics (new and existing) may have the option to participate in a quality improvement collaborative and to pilot a new toolkit developed to include resources identified in the evaluation. Improvements in providers' self-efficacy could likely be achieved using the methods participants requested, such as hands-on training sessions, which afford opportunities for practice, role-playing, and feedback. Considering the different types of health care workers in the public health clinic settings, it may be helpful to ensure that the training format and content is relevant to a diverse audience (e.g., by inclusion of optional modules and by using trainers with different backgrounds and expertise for different components of the training). Yearly updates to training materials and topics may be necessary to ensure that information is current with

clinical recommendations, resources, and tobacco use trends in the state. Grant funds could be used to train county staff to become Certified Tobacco Treatment Specialists in order to increase referral resources. Enhanced and sustained efforts to increase provider's understanding of the quit line may further facilitate patient referrals.

Our results showed that some interviewees felt the 5As delivery could be improved with incorporation of technologies such as texting and other media. Indeed, similar applications (e.g., mobile health or mHealth interventions) have widely been used in other areas of public health [21, 22], and could also be explored for use in tobacco cessation programs (e.g., use of internet based and text-message based smoking cessation programs specific to pregnancy) [23]. Use of interactive social media, videos, and other relevant technology can also be tested and promoted to enhance outreach and follow-up, especially considering the rapidly growing interest and use of social media in the United States [24].

Some limitations exist to this study. First, the varying lengths of time in which clinic directors had been in oversight of the clinics may have influenced their knowledge of the extent of implementation of the 5As in their respective clinics. However, the effect of this limitation on study results is expected to be minimal since perceptions about barriers and facilitators to implementing the 5As were similar across the interviews after stratifying by time as director. Second, smoking cessation interventions were not stratified by provider type because of small sample sizes. Third, changes or attrition of staff trained to implement 5As intervention, coupled with lack of fidelity or inconsistency in implementing the 5As intervention in study clinics may have resulted in misclassification of clinics by training status. Fourth, the self-reported responses to the online survey by clinic staff may have resulted in misreporting. Similarly, no data were collected regarding the staff's perception of the quality of the training received.

Conclusions

The findings from this study reveal important barriers and facilitators related to implementing the 5As in Ohio public health perinatal clinics. Major barriers included paperwork related documentation challenges, and lack of self-efficacy in engaging patients in smoking cessation counseling. Simplifying documentation of the 5As by integrating into routine, accepted forms, and providing enhanced, hands-on training in smoking cessation interventions may increase healthcare providers' self-efficacy in helping pregnant clients quit. These study findings have the potential to improve and expand the delivery of smoking cessation interventions, thus improving the health of pregnant and post-partum mothers and their children.

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